

By HART J. GOSLEE, B.S., D.D.S., Chicago, Ill.

### Removable Bridgework and Partial Dentures.

Whatever the casting process may have done in the way of revolutionizing and simplifying the methods of procedure formerly observed in the filling of teeth, and in the construction of single crowns and fixed bridges, and however applicable it may be to this line of work, it is also equally applicable to and especially valuable and useful in the construction of removable bridgework, and all forms of partial dentures—where the same accuracy of adaptation and the same requirements of strength are demanded, and where the fixtures are usually and necessarily larger.

While no class of work will, perhaps, ever take the place of well-adapted and properly constructed “fixed” bridgework, or answer the same purposes, yet, since the success of such work primarily depends entirely upon the *favorable location and stability* of the supporting teeth or roots, some form of removable structures will always be indicated in that large percentage of cases where these combined essentials do not present.

Hence, “fixed” bridgework is indicated only in those cases where the *position and stability* of the supporting teeth are favorable, while in *all cases* where these primary requirements do not present, *removable structures* are not only *indicated*, but *demand*ed.

The successful application of removal structures, while not depending so much upon the favorable position or location of the supporting

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teeth in the arch—for the reason that much of the stability of the structure is assumed by contact of the base of the piece with the contiguous soft tissues—will necessarily depend largely upon the manner in which fixation, attachment or anchorage to the supporting teeth is obtained.

Thus the application of removable structures which are sustained by some mechanical means, instead of by simple contact with the soft tissues, such as a so-called partial “plate,” resolves itself largely, first, into a question of anchorage to the remaining or supporting teeth, and, second, into the best method of obtaining the required accuracy of adaptation and strength in the construction of the fixtures; in both of which instances the casting process affords an almost unlimited range of application and a wide field of possibilities.

### **Anchorage or Attachments.**

The question of the best or most universally applicable means of obtaining anchorage for removable structures of any type is one which will probably always depend much upon personal equation or individual preference, but while the casting process is alike applicable to any and all of the various forms of attachments, it is particularly applicable to the construction and use of *clasps* of various forms, and to the use of the “Roach,” “Morgan,” or any of the other similar designs now manufactured for this purpose; and these two general types of anchorage afford a very wide range of application and general usefulness when combined with the facilities and advantages now offered by the casting process.

As applied to *molars* and *bicuspid*s, clasps must always be regarded as a most useful and reliable means of obtaining attachment for the anchorage of all forms of removable bridges or partial dentures. When their use is confined to these teeth, when they are of favorable shape and position in the arch, and when they are made in accordance with the general requirements of a clasp, as previously detailed, and made of an alloy possessing toughness and resiliency—such as *rolled* or “plate” *clasp-metal*,” and properly adapted to the supporting tooth, with an adequate provision against the possibility of subsequent settlement, they afford, perhaps, the most simple, secure, permanent and universally applicable means of obtaining attachment to these particular teeth, which is now at our command.

It must be remembered, however, that because of the injury to the natural crowns of teeth likely to result from the influences of mechanical abrasion or attrition, the best and most permanent results are to be obtained by first placing artificial crowns upon the roots of the supporting

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teeth, and adapting the clasps to them. Such crowns may be made of gold, or of porcelain if the cosmetic requirements demand, but it should always be observed that the shape given to them is made favorable to the subsequent adaptation of the clasp.

An occlusal rest or some other means of preventing any great degree of subsequent settlement in the mouth, however must always be observed, for if such provision is not made, the case will continue to settle as absorption progresses, with the result that the occlusal relationship and usefulness of the piece may be destroyed, and much discomfiture and



FIG. 475.



FIG. 476.

injury to the soft tissues surrounding the supporting teeth may be caused by impingement of the clasps upon them.

Perhaps the most simple, practical and useful  
**Typical Application.** application of clasps to gold crowns may be made by making the crown with straight or parallel sides and cutting a seat in the occlusal surface of the wax of proportions sufficient to accommodate an occlusal rest, just before investing and casting (Fig. 475).

When the crown has been cast (Fig. 476) it should then be finished and mounted. The clasp should now be made of 26-gauge clasp-metal and trimmed and adapted to the crown directly in the mouth, after which a plaster impression should be taken with the clasp, or clasps, in place, and the model made after carefully ascertaining that the clasp occupies its proper position in the impression. If the case is to be made of *vulcanite*, the model may be of *plaster*, but if the clasp is to be attached to a *gold* or *platinum* base by means of *soldering*, the model should be made of investment material.

Where *vulcanite* is to be used as a base, the  
**Vulcanite Bases.** clasp should first be detached from the model, exercising care so as not to break off the plaster tooth supporting it, and when thus loosened and then readjusted to place, a piece

of 17 or 18 gauge round iridio-platinum wire should be adapted to the broad surface of the clasp with the occlusal end bent at a right angle and fitted into the seat in the plaster tooth, corresponding to the same accommodation in the crown, and the other end formed into a loop of suitable size to insure secure attachment to the vulcanite (Fig. 477).

When so fitted the desired relation of the wire to the clasp should



FIG. 477.

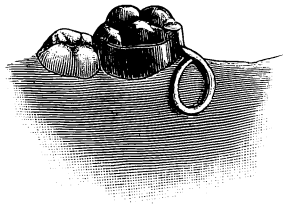


FIG. 478.



FIG. 479.

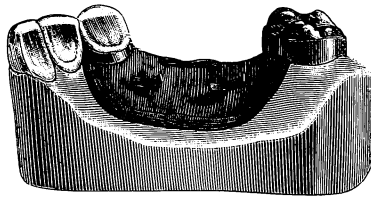


FIG. 480.

be sustained with hard wax, the whole gently lifted off of the model, invested and soldered, after which it may be replaced upon the model (Fig. 478), and the case completed in the usual manner.

Where a gold base is used, the base should be made as soon as the investment material model, with the clasp in place, has been obtained. A piece of 17- or 18-gauge round iridio-platinum wire should then be bent and fitted into the seat, and to a close contact with the flat surface of the clasp, and to the surface of the gold base (Fig. 479). It may then be soldered to both directly upon the model (Fig. 480).

A typical case showing the application of clasps to gold crowns on the two lower second bicuspid is illustrated in Fig. 481.

Another very useful application of clasps to gold crowns is to be obtained by first making the crown with a narrow band, and forming and shaping it to meet the other requirements with wax, after which a should-

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der should be trimmed away in the wax to follow and accommodate the desired outline and form of the clasp. The crown should then be invested and cast, after which 26-gauge clasp-metal may be fitted to place on the crown, and subsequently attached to the base in the manner indicated above. Or the clasp may first be made in wax to fit the groove in the crown, and this subsequently cast (Fig. 482).

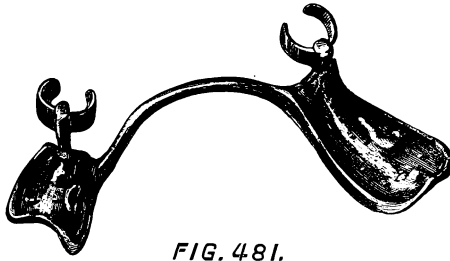


FIG. 481.

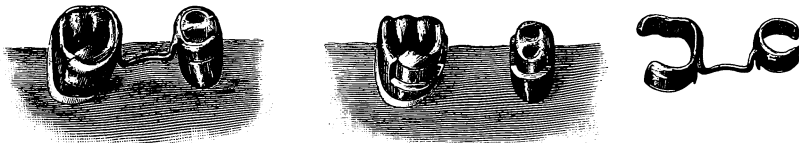


FIG. 482.

**Cast Clasps.** The casting of clasps, however, is not recommended, for the reason that even though clasp-metal be used for the purpose, the progress of casting it seems to completely destroy its resiliency—the very quality which a clasp *must* possess—and causes it to become very brittle. Hence, clasps or any other parts where toughness, strength and springiness are demanded should always be made of *rolled* clasp-metal alloy.

**Clasping Porcelain Crowns.** These same principles are equally applicable to the adaptation of clasps to porcelain crowns in all cases where porcelain is demanded for cosmetic reasons, and where the crown may be so shaped or ground as to afford similar opportunity.

**Clasping Natural Crowns.** Whenever the adaptation of the clasp directly to the natural crown of a tooth may seem to be indicated or warrantable—which is not often, except, perhaps in old age—the same general principles should always be observed, and in cases where the placing of an occlusal rest, as indicated, may interfere with the occlusion, the tooth to be clasped should be ground until suitable accommodation is thereby obtained.

## ITEMS OF INTEREST

### Use of "Roach" Attachments.

If clasps are especially applicable to the molar teeth, and occasionally to the bicuspsids, and particularly when they may be used in connection with gold crowns, the ball and telescoping tube attachments designed by Dr. F. E. Roach are equally applicable and useful as applied to the ten anterior teeth, and especially to the *six* anterior teeth, where they may be used in connection with inlays or porcelain crowns, and where clasps of any form are impracticable, owing to the unfavorable shape of these teeth.

While the two parts may be interchangeably used, it is usually best to attach the *ball* to the supporting tooth and the *tube* to the removable part of the fixture, as this procedure more readily admits of subsequent tightening in the event of wearing loose, which contingency is more or less inevitable.

#### **In Connection with Inlays.**

When it is desirable to use the Roach attachment in connection with an inlay, the cavity must be prepared so that the inlay will involve or include sufficient surface and thickness to admit of placing the ball part of the attachment in the most favorable position to afford secure attachment, and at the same time offer opportunity for the proper adjustment of the adjacent artificial tooth to be supplied, which always demands that it be placed *well to the lingual surface*, and all inlays used to support this or any other type of attachment for removable work must have one or more pins in them.

When the cavity has been so formed and the wax filling made, about one-half of the shank projecting from the ball should usually be cut off, the remaining end then grooved or roughened, the ball grasped with small pliers, slightly heated, and the small surplus end then forced into the wax filling to the proper depth, and at the proper point. After observing that this attachment to the wax has been made secure, the sprue-wire should then be likewise attached at a favorable point (Fig. 483 A), and the filling then invested and cast (Fig. 483 B).

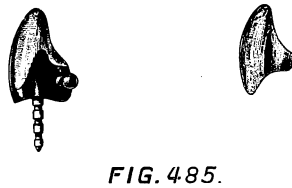
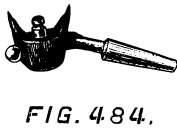
By this means the attachment becomes an integral part of the filling and its position in relation to the filling, together with a greater degree of strength than is usually obtained by soldering, is facilitated and insured.

#### **In Connection with Porcelain Crowns.**

Where the attachment is to be used in connection with porcelain crowns with cast bases, such as are indicated and now more or less generally used in restoring the ten anterior teeth, a narrow, well-adapted band should invariably be used, and the lingual or approximal surfaces of the porcelain tooth or crown must be so

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ground as to afford sufficient space between it and the root to allow of a thickness of wax which will accommodate the attachment of the ball at the proper point. This part of the attachment should now be prepared (as indicated for inlays), and then securely attached to the wax while the crown is in position, after which the sprue-wire may be attached, the porcelain removed (Fig. 484), and the base invested and cast (Fig. 485).



## **Precautions.**

In thus casting directly to the attachment it must be observed that the end is first properly notched or roughened and then that it is forced or buried into the wax to an extent which will insure strength in the subsequent union of the attachment and gold used in casting. It is also well to paint with whiting the surface of the ball up to and including the slight groove into which the tube fits before investing, as such a precaution precludes the possibility of increasing the size of the ball by the addition of any of the metal used in casting, or of fusing it during this process, both of which may and sometimes do happen.

The Morgan, Griswold, or any of the other various forms of attachments which are made in gold, or any of its alloys, may be used in similar manner, it being only necessary to know that they will withstand the fusing-point of the gold or alloy used in casting to them.

A combination of "Roach attachments" applied in this manner to the anterior teeth which are to be used as supports, or even where the shank of the ball is cemented directly into the tooth without either inlay or crown, or where, for any reason, it may be used in connection with a gold crown, or even with an "open-face" crown, and of "clasps" applied to the posterior teeth seems to offer a range of application well-adapted to meet all of the requirements of removable bridgework.

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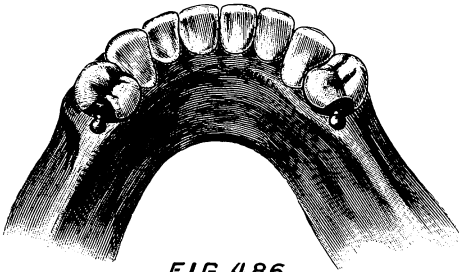


FIG. 486.

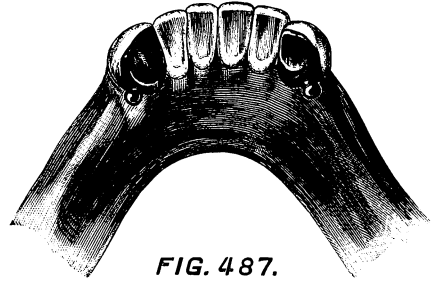


FIG. 487.

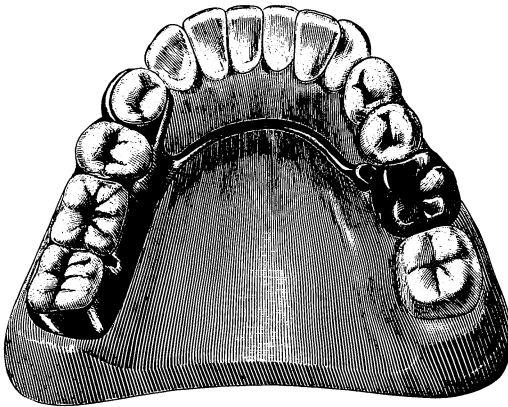
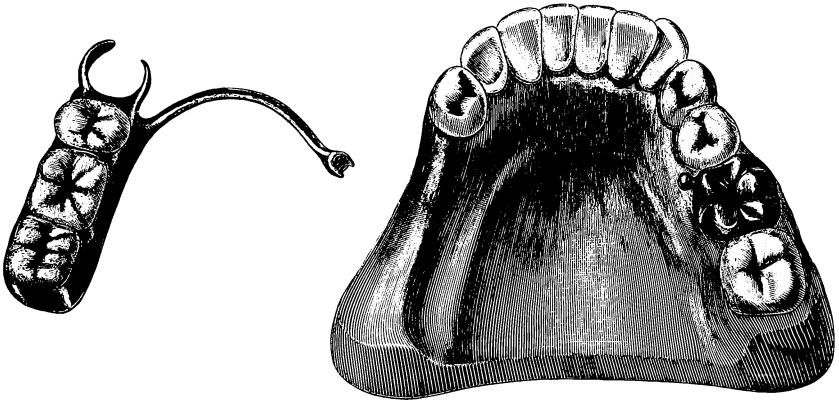


FIG. 488.



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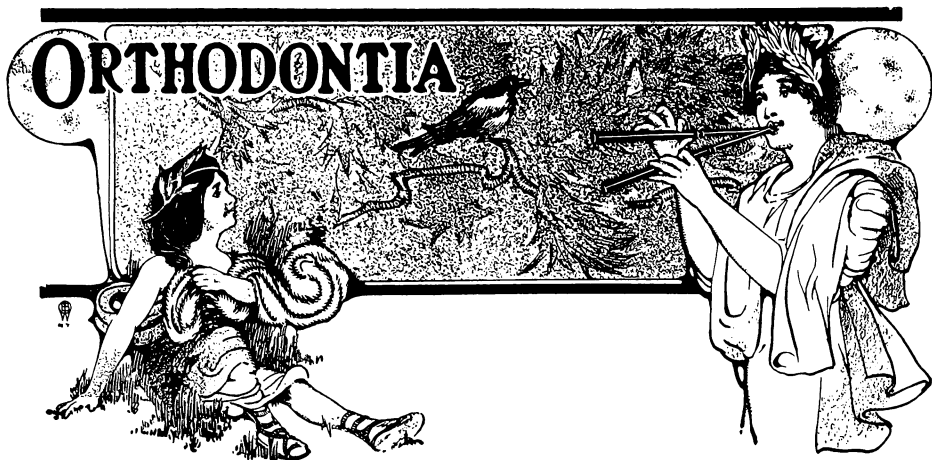
A typical application of these attachments where porcelain crowns are used on the lower first bicuspid is illustrated in Fig. 486, and in connection with large inlays, or so-called "Carmichael" attachments with a post of generous size in each, as applied to lower cuspids, is shown in Fig. 487.

Another typical case, showing the application of a Roach attachment to a molar crown on one side, and of a clasp to a bicuspid crown on the opposite side, as a means of supporting the missing bicuspid and molars on one side of the arch only, is illustrated in Fig. 488.

The methods advocated and used by Peeso, Fossume and others, however, may seem to possess especial advantages in, or to be particularly applicable to, some classes of cases, but the casting process is also equally applicable to the construction of removable cases in which any of these methods may be used, and will afford increased accuracy and facility in their use.

*(To be continued.)*





## Report of Work on "Base versus Noble Metals in the Mouth."

By CLARENCE J. GRIEVES, D.D.S., Baltimore, Md.

*Read before the American Society of Orthodontists, Cleveland, 1909.*

In following up the work assigned to this committee at the last meeting of the society, *i. e.*, the behavior of the different metals in the child mouth, and the damage resulting therefrom, your committee has to report a few variations as to minor details in saliva tests, which may vary for years to come, so complex is the subject. In the main, the cardinal points presented last year are confirmed by the year's work, and stand until furthermore questioned; for, like all such work, they are always subject to change.

### **Metals Used in Appliances.**

We take this opportunity to accent the folly of using any alloy in the mouth which contains electrically opposed metals: German silver, plain or gold plated (Fig. 1); from 20-karat platinum gold, containing 2 per cent. zinc, all down the line of possible combinations containing base and noble metals in contact (Fig. 2).

### **Silver Ligatures.**

Pure silver wire has been advocated for ligatures, because of a supposed tolerance of the tissues for silver. Physically it meets the requirements: under the gingival margin it maintains its color, as do other metals protected by the gingivus, without disintegration; above the margin,

and exposed to saliva, it blackens quickly. The salts deposited are presumably sulphids, and if so quite bactericidally inert. The usual action of epithelial tissue on silver all over the body is the production of  $H_2S$  and sulphids. Silver foil applied directly to the freshly cut tissues precipitates silver salts when attacked by the tissue exudate, effectually preventing infection even on large surfaces. This, with sterile gauze and hot water, is the only method of sterilization employed for the most sweeping operations by one of the leading gynecologists of this country.



FIG. 1.

Fig. 1—Approximal portion of gold-plated German-silver molar anchorage band exposed three weeks in mouth showing damage at the gingival line. (a) gold-plating above the line; (b) line of crater at the line. (c) perfect gold-plating below the line

If saliva were as simple in its chemistry as the blood, the case would be parallel, but it is not. Michaels says, "The saliva contains every soluble and crystalline principle which is found in *excess* of blood plasma, and which is susceptible of being dialized through glandular activity." (*Sialo Semiology*, Michaels, Proceedings Third International Dental Congress.) So we can not presume that the salts would be the same, although this is not saying that silver is not fit in the mouth. Silver in contact with gold should not degenerate electrolytically, and it may be just the thing for ligatures.

We know of no substance which will take the place of clean metals in ligatures, and the question is far from being settled.

Conditions would be ideal, were it possible to do away with ligatures and with fixed appliances, and in the judgment of the writer it should be the aim of the orthodontist, first and foremost, after planning his

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appliances to produce definite results, to simplify the appliance into the easily removable class, and ligate as little as possible. The reasons are obvious and are given in my previous paper.

While slightly away from the province of this report, the writer thinks he will be pardoned for the suggestion to follow, as it is of the highest import. The American Society of Orthodontists should establish a series of standards to be known as the "A. S. O." standards, not only in the metals to be used in appliances,

### **Mechanical Standards for Appliances.**

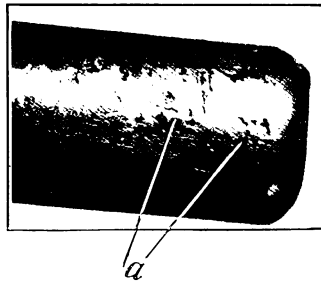


FIG. 2.

Fig. 2—Section of buccal tube worn two months: 18k platinum gold, 5 per cent. zinc. (a) craters by electrolysis.

their chemical and physical characteristics, but mechanically as to the pitch and size of the threads in bars, bolts and nuts, gauges of wire for accomplishing the greatest work with the least metal in arch retainers and ligatures; gauges of bands to meet stress; ductility, elasticity and tensile strength of metals, etc., etc. All such standards, when worked out by a committee of mechanical experts should be the property of the Society and should be known as "American Society of Orthodontists Standard." The manufacturers would then come to your society for his ideals instead of your going to him individually, and after untold trouble convincing him of the market for the particular appliance you wish made sufficient to warrant his making it. Orders from all over the country for "A. S. O." standards would produce the desired result.

For a parallel confirmatory case we have only to go to the great railroad world, where twenty years ago prior to the formation of the "Committee on Standards" of the Master Car Builders' Association, in the matter of car construction, chaos reigned supreme. Rarely could a freight car leave its home road without reshipping its load; parts of

interchange differed with each road, and on a break-down the car had to be patched up and returned to the home road; there were as many forms, for instance, in car-couplers as there were "cranks" to patent, and manufacturers to produce them.

This situation was attacked by the "Committee on Standards" of the Master Car Builders' Association, made up of representatives from all the railroads in the country with a vote for every one thousand cars, and to-day all interchangeable parts, no matter where manufactured, must conform to "M. C. B. Standard," otherwise the railroads will not buy the product. A freight car may leave its home road and spend its life on foreign roads being repaired, never losing a load, and never returning; the salvage in time, trouble and money to the railroads and shipping, all the result of the work of this Committee, is simply incalculable.

Your society can accomplish in appliances like results, and it is a duty you owe not only to your membership, but to that vast majority of dentists compelled to do this work in communities which do not support an orthodontist.

## **Attaching Media for Appliances.**

After a long series of observations on bands and retainers, we are more firmly convinced than ever before of the correctness of the statement that all bands, anchorages, retainers, etc., and all parts producing retention centers, should be covered by bands when necessary, to fix the appliance and be attached by some cementing media. The difficulty in obtaining attachment with oxyphosphate in orthodontia cases, the greater difficulty and pain in breaking such attachments when teeth are loose, the danger to the enamel of an unknown wash-out of cement under a band makes some other cementing media more desirable.

Doctors Young and Ottolengui have submitted specimens of retainers set with a gutta-percha preparation which, with others the writer has seen in and removed from the mouth, apparently prove this media to be most excellent.

Where the band remained attached in those examined, the adjacent enamel was in perfect condition, gutta-percha behaving, as it does in fillings, becoming leathery on the edges and swelling up, but preventing decalcification; it is only fair to state that these bands were of the bolt type, such as can be tightened up from time to time as the preparation swells; this is a great advantage in prevention of retention centers, and no advantage with oxyphosphate which such pressure will spoil and detach.

The palatal surface of a molar on which a band attached with cement had been loose for some time (Dr. Ottolengui's specimen) is submitted. This was cleansed, dried and exposed to nitrate of silver solution, and shows comparatively little decalcification (Fig. 3).

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With the idea of combining gutta-percha and cement as is practiced in the setting of crowns, the writer has now three bands set in carious mouths with the gutta-percha preparations applied to tooth and the oxy-phosphate to the bands; there is an appreciable element of safety in gutta-percha over cement, in that it is not subject to solution, and it would appear that the advantages of both would accrue if combined, but the writer's knowledge is not sufficient to recommend this method.

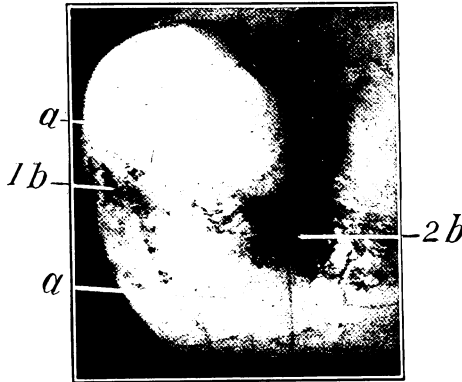


FIG. 3.

Fig. 3—Mesio-palatal angle of temporary molar (Dr. Ottolengui's specimen). (a) Parts covered by the band. (1b) and 2b) Decalcification spots. It cannot be asserted that they had not occurred previous to placing of band; it is unlikely that (1b) had occurred.

### **Guarding Retention Centers.**

Dr. Hawley suggests that after the case be cleaned up it be reset and then dried out as well as possible, and all retention centers between teeth arches and ligatures be filled with the ordinary sticky wax of the laboratory usually rich in gum copal.

The writer believes there is value in this idea and further suggests that the arches and ligatures be dipped for a slight film before being applied, or coated with cavity varnish that will protect from moisture and allow the wax to stock.

### **The Salivas of Children Wearing German Silver Appliances and the Metallic Waste Found Therein.**

Careful chemical and microscopic studies were made of four samples of saliva of children wearing German-silver (plain and gold-plated) appliances and brass wire ligatures.

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Only small quantities daily (before cleaning the teeth) of the night and morning saliva were collected covering periods of from six to nine weeks in total quantity of from about 75 c.c. to 130 c.c.

The report herewith of E. A. Slagle, Ph.D., Chief of Department of Pharmacology and Chemistry to the Johns Hopkins Hospital and Medical School, on the sample Dr. F. C. Kemple, is typical. Quantity of sample, 130 c.c.: 100 c.c. examined; girl patient, age 13 years; saliva taken over period of 9 weeks, morning before cleaning teeth and evening before cleaning teeth; patient wearing regular gold-plated German-silver appliances and brass wire ligatures: odor slightly fetid; reaction alkaline. Digested the sample 100 c.c. with 5 c.c. of sulphuric acid in a Kjeldahl flask without other oxidizer 9 hours, and then drove off the excess sulphuric acid; the digestion was carried out in a Kjeldahl flask on account of the volatility of chlorides of copper."

"To the solution acidified with hydrochloric acid was added potassium ferrocyanid, and only zinc ferrocyanid was precipitated."

"From another portion of sample zinc sulphid was precipitated. Neither ammonia, potassium iodid nor potassium chromate gave evidence of copper; the last-named test is sensitive to copper to one part in forty thousand."

"All tests for copper, nickel and iron were negative and the presence of a salt of zinc was confirmed to the amount of 5 Mg. (1-12 of a grain). From the position of the metals copper and zinc in the tension series (series of electro positive and negative substances; the amount of potential), one would not expect to find that copper had been dissolved from this alloy (German silver), and it can be easily calculated that the amounts of nickel and iron would be too small for detection in the sample."

The question of what salt of zinc was present was taken up and a reply had as follows:

"Since saliva contains normally Cl and SO<sub>4</sub> ions, it would only be a guess as to how the 5 milligrams of zinc were contained in the sample of 100 c.c.

"However, on filtering the saliva and washing with hot water, the filtrate gave no tests for metallic ions; this seems to indicate that the zinc was in combination as an organic salt with some of the constituents of the saliva. There is, of course, the possibility that the zinc was held mechanically even in an inorganic molecule."

Five Mg., or 1-12 gr. of zinc salt in 100 c.c. of nine-weeks' saliva, is a very heavy percentage when we consider that out of the full amount of German silver in a "tie-up" (84.6 grs.), two-ninths (or 18.6 grs.) is

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zinc; ten brass ligatures weigh 6.16 grs.; one-third of which, or 2.05 grs., is zinc, making the total zinc in "tie-up" 20 grs., and 1-12 grs. of this is found in a small amount of saliva taken in nine weeks. This is the normal percentage of waste metals from electrolysis out of an alloy like German silver (Cu. 6, Zn. 2 Ni), with the saliva as a mild electrolyte. Further, it is a positive proof that the alloy degenerates in the mouth by this method. Carrying this 1/12 gr. soluble salt to the ultimate, we are confronted by a paradox: the average day's saliva is 1000 c.c. (1 quart), which worked out in the ratio found in the specimen for nine weeks in 100 c.c. would show a total loss of 52 grs., and as a whole "tie-up" weighs but 90 grs., the waste metal would be more than half, an utterly impossible conclusion, and as we know the total loss roughly by weighing old appliances to be about 10 grs. in this period, it is demonstrated that metallic disintegration in the mouth is neither progressive nor regular and not a matter of arithmetic.

There are several very interesting questions growing out of these analyses of saliva.

**What Preserves the Saliva.**

It has been noted by Ferris (*Dental Cosmos*, Sept., 1909) and others, including the writer, that while normal child saliva kept for a short time is subject to putrefaction and most offensive, samples of saliva from the mouths of children wearing German-silver appliances may be kept for an indefinite period with practically no odor.

The samples analyzed were kept from two to three months in glass-stoppered jars and were but "slightly fetid." It is recognized that there are normal salivas, specimens of which can be kept some time without putrefaction, but in the writer's experience these are invariably the salivas of adults. Child saliva invariably decomposes offensively.

Michaels says, "The salivas of adolescence contain a dextrine principle (glycogen) susceptible of fermentation under the influence of ptyalin in the presence of earthy salts" (*Ibid.*). Add to this the presence of decomposing food from retention centers about appliances and we have what should be one of the most offensive specimens of saliva imaginable, instead of one "only slightly fetid," and it becomes a question as to what the preserving element is.

It will be recalled from my last paper that the analyses of the dark salts found on the teeth and appliances proved to be insoluble sulphids of copper and possibly nickel. That a white salt (again insoluble) was found on appliances giving a reaction for copper and phosphorus, presumably a phosphate; while this salt was totally unlike salivary calculus, amorphous compared to the crystalline calculus and was rare, existing



in small quantities, the very difficulty of collecting might have introduced particles of calculus spoiling the analysis.

These are the only insoluble salts of metals found after the most careful work of last year by Schmidt; the only soluble salt is that reported herewith shown by Slagle to be presumably an organic combination of zinc; copper is not present in more than 1 to 40,000 by the chromate test; the only germicidal salt of zinc is the chlorid, and the question would be

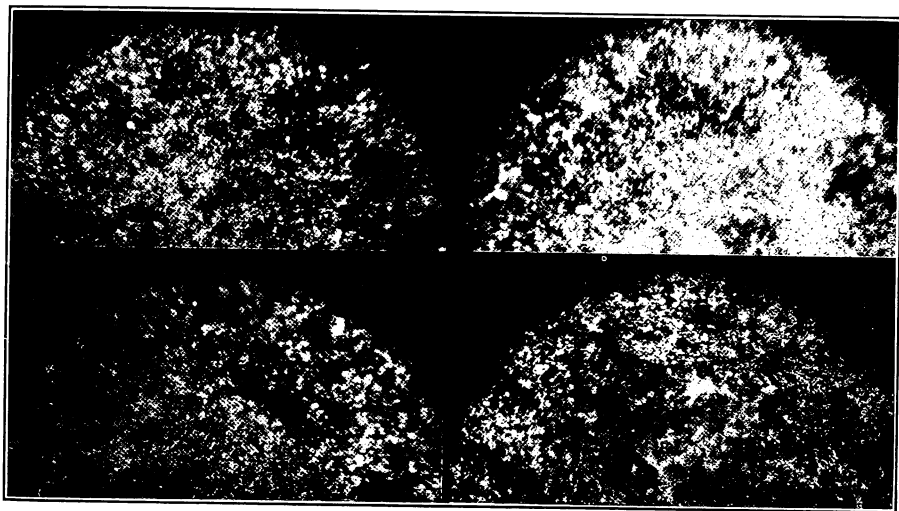


FIG. 4.

Fig. 4—Slides from nine weeks, morning and night saliva of children wearing gold-plated German-silver appliances. A and B from the heavy precipitate at the bottom of the jar. C and D after shaking thoroughly.

easily settled if chlorid of zinc were present, for chlorids are readily detected, but by every reagent in this analysis chlorids are excluded.

In discussing the writer's paper, "The Behavior of Certain Metals in the Mouth" (*Dental Cosmos*, Sept., 1909), Ferris says that crystals of the sulphate of copper have been detected by Dr. Dexter microscopically in the salivas of children wearing German-silver appliances, thus implying that sulphate of copper prevented putrefaction. This we question for several reasons as follows:

Four slides are presented from smears taken from the salivas here reported, collected night and morning, covering a period of six to nine weeks; two of these were made from the dark precipitate collecting at the bottom of the jar; the other two from the whole specimen after

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thoroughly shaking the bottle, and you will note there are no crystals present (Fig. 4).

We were told by Dr. Ferris that his method is to have the child fill the spitcup in one or two sittings with enough saliva for analysis, which, of course, precludes the possibility of any quantity of metallic waste being present, even if very active chemical changes were occurring, and if there are no crystals present in a composite of nine-weeks' saliva, it is hardly likely they can be detected in one-hour's saliva.

This is the very reason why the analyses failed (reported in last year's papers) to show any metal present; the most careful chemical work and the spark spectra test all giving negative results.

It is hard to conceive of so much metallic waste from German silver as to produce precipitation of copper sulphate crystals visible by the microscope, and if such were present the presence of the salt would be readily detected by chemical reagents.

Quoting Dr. Ferris again (*Dental Cosmos, Ibid.*), Dr. Dexter at his suggestion put a band (presumably German silver) "which had been worn three weeks, into a gelatin culture and found a negative result after incubation. He took the band again, scraped off the surface, put the scrapings in a gelatin culture and the band in another gelatin culture, introduced both into the incubator at the same time and found that the scrapings had developed bacteria, the band none." This is an interesting confirmation of the bacteriological work reported in last year's paper, where similar tests of new bands and arches proved negative, proving some action on the *new* metal. It is a further confirmation that the salts found on appliances are inert as germicides, because the scrapings containing these salts, together with the contained filth from the crypts in the metal, produced growth in a gelatin culture.

In the light of the foregoing, it is difficult to explain just what prevents fermentation in the dirty salivas of children wearing German-silver appliances. It has been shown that copper does not exist in more than one in forty thousand parts; that the zinc salt is organic and hence inert; that the action is produced by the fresh metal and not by the (sulphids) salts depositing on it, and we are at a loss to explain such phenomena.

Fitzgerald recently in the *Mechanical and Chemical Journal*, after minute research in copper, claims that copper to the dilution of one in two million will prevent fermentation; just how such dilutions are detected we can not say.

It was tentatively suggested in my last paper that we *might* account for the absence of copper in the saliva from the fact that as soon as the copper ion was liberated by electrolysis it was attacked by the ever-

present hydrogen disulphid ( $H_2S$ ), produced by decomposition of nitrogenous food, and deposited immediately on teeth and appliances as an insoluble sulphid.

Some facts are assured, however: *There is metallic waste from German silver which is ingested, and the saliva is profoundly modified*, acting to prevent fermentation indefinitely, and we can feel assured that any such agent will absolutely interfere with the enzyme ptyalin which physiologically, not long since, was considered of little moment in digestive processes, for while it was known that the food containing ptyalin passed directly into the acid media of the stomach, it was also known that acids neutralized the action of enzymes. But it was overlooked, as Howell ("Physiology") has lately explained, that the mass of food collecting in the esophageal end of the stomach is protected by its bulk from the hydrochloric acid present, and that fully two hours of salivary digestion by enzymes occurs before the stomach fluids begin their work.

So any appliance wasting metal placed in the mouth which interferes with such an important digestive process, as we are assured preservative salivary changes such as have been mentioned, will, is a serious matter.

### **Prophylaxis and Prevention of Enamel Decalcification.**

The value of silver nitrate in the prevention of enamel decalcification is a question which can well be discussed at this time.

The subject is not new. For years Stebbins, L. C. Bryan, Hart and others have advocated its use in operative dentistry as a prophylactic measure, and recently Conrad has clinically explained his methods to many societies.

The writer regrets exceedingly that Dr. Conrad could not accept this Society's invitation to be present and show specimens of teeth treated with his solutions in the mouth, that we might know just what happens to the enamel surfaces.

We can not for a moment undervalue Dr. Conrad's work, and there is no question but that his methods applied to orthodontic cases will produce results. These results, however, must first be submitted to the microscopist to prove that no staining occurs: to the pathologist and chemist to prove that the dental tissues are benefited and the mouth tissues and delicate mouth fluids are not harmed; finally, to the toxicologist, that no systemic effects arise from the continued use of nitrate of silver by the operator, and, more particularly, by the patient.

A study of the action of silver nitrate can only be made by considering its differing effects on the wet and dry enamel. Out of the

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mouths in very dilute solutions it has long been a standard tissue stain used by histologists; on short exposure no doubt is possible of the deep staining qualities on the dried and cleaned tooth structure. A dry tooth with enamel decalcification and faults, if placed in nitrate of silver solution, even when not prepared and cleaned, will stain in the inter-rod substance because the mucus plugging such spaces in drying contracts and does not coagulate.

A freshly extracted tooth with enamel defects covered by mucus and placed in silver-nitrate solution *will not* stain in the slight enamel decalcification, because the spaces between the enamel rods existing in such are plugged by mucus, which coagulates into an insoluble coating, and it is to this coagulating power primarily, and sterilizing power secondarily, of the mucus in the saliva that we owe the prophylactic action of silver nitrate; it acts then by coagulating the mucus and preventing the carbohydrate pabulum from reaching the bacteria in the gelatinous plaque.

Just a word may be pardoned here on the question of the mucus in the saliva, because it is such an important factor in prophylaxis generally in which all orthodontists are interested.

All enamel surfaces, except those exposed to morsal and incisal stress, are covered in the mouth by a layer of mucus which we here accent exists independently in the saliva in ropes, and hence deposits on all surfaces.

The parotids are the only salivary glands not secreting mucus, and enormous quantities are produced by the mucous glands of the mouth epithelium; it is Nature's protector of all epithelial surfaces, a thick layer lining the gastro-intestinal tract; normally alkaline in reaction, almost impenetrable by acids, it seems a reasonable conclusion that this is Nature's own protection for that product of the epithelium, the enamel of the teeth; its alkalinity, its coagulation when attacked by acid, its colloid consistence preventing disintegration by electrolytic dissociation, as only the colloids can, are all ideal for a guard against acid disintegration.

A. Hugenschmidt (*Cosmos*, 1906, "Experimental Study of the Different Modes of Protection of the Oral Cavity against Pathogenic Bacteria"), speaks highly of the mouth mucus as a protective agent, and quotes Wurtz's and Lemoyez's tests of nasal mucus, three-hours' contact of which with *Anthrax*, *Staphylococcus aureus*, *Streptococcus* and *Colon Bacilli* destroyed the *Anthrax* spores and attenuated the others. Widal says of bronchial mucus as does Stroganoff of the mucus of the cervix uteri, that it acts first mechanically, gluing the spores together away

from their habitat; secondly, as a direct bactericidal agent toward microbes.

Others might be quoted were there time, and it is the writer's firm conviction that normal mucus is Nature's own protection for enamel surfaces; of course, body dyscrasias will affect this secretion, producing acidity. The fact that the gelatinous plaque makes the buccal mucus its attachment to enamel surfaces does not militate against the protective

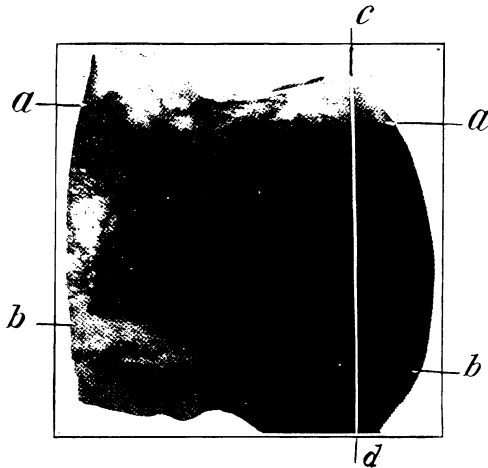


FIG. 5.

Fig. 5—Disto-palatal angle of temporary molar decalcified, cleaned up in the mouth, to which rubber dam was applied and coated with silver-nitrate solution. Note the well-marked outline (a) and (b) where the uncemented band surrounded the tooth.

action of mucus on the enamel, for it must be remembered that the teeth of all immunes are likewise covered with mucus and always have been, and that if mucus were destructive rather than preservative of enamel continuity teeth in our race would cease to exist, so thoroughly are they encased by it. The fault is to be found in the variation from the normal in mucus, which permits the plaque, or better still, the carbohydrate media, to reach the bacteria on enamel surfaces.

So, when decalcified spots occur and we are told that they are polished out and disappear, we know it is *impossible* to polish out effectually decalcified enamel without getting down to dentine ("Base *versus* Noble Metal Appliances in Orthodontia, ITEMS, May, 1909, also Fig. 6). What really happens is that on the removal of the cause for acidity (the appliances), the open spaces between the enamel rods become

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plugged with mucus and refraction is broken, the light reflecting from these surfaces as from normal enamel.

If such enamel surfaces receive the thorough massage with pumice and wood by hand that Dr. D. D. Smith gives, and are then cleaned with ammonia and alcohol and placed in the rubber dam, and, according to



FIG. 6

Fig. 6—Ground section of molar shown in Fig. 5 on the line (c) and (d) showing how deeply the silver-nitrate solution penetrated the decalcified inter-rod substance when such is thoroughly cleaned up and desiccated even when applied in the mouth.



FIG. 7.

Fig. 7—Decalcified enamel showing all the staining possible after prophylaxis of the surfaces one day, and the application on the next day of the silver-nitrate solution. This surface was simply wiped dry and blown off by air at 15 pounds pressure without the use of other desiccants or the rubber dam.

L. C. Bryan's method, soaked in nitrate of silver solution, *these spots will stain* (Fig. 5 and 6).

If these spots are not so treated, but the tooth dried in the ordinary way is simply wiped with the solution, *they will not stain* (Fig. 7), and those who state that they do thorough prophylaxis where there is enamel decalcification and apply silver nitrate and do not stain enamel, *do not do perfect prophylaxis*—if by such is meant the removal of all the mucus covering of the teeth.

The best results, from the use of silver nitrate will therefore be obtained, first, by most thorough massage of the enamel surfaces

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after the method of Dr. D. D. Smith; the patient is then dismissed for twenty-four hours, when the teeth are dried as thoroughly as possible without the rubber dam, and coated with a solution of from 10 to 20 per cent. silver nitrate, according to the carious tendency of the mouth, on which will also depend the frequency with which this treatment is applied, varying from every two weeks to once a month, or even less frequently.

While silver nitrate coagulates the freshly deposited mucus—and that is the reason for the delay of twenty-four hours, and staining is liable to occur if the solutions are applied to dry surfaces at once after cleaning—and while we know by coagulation it will prevent the carbohydrate media from reaching the plaques, should any be not removed by hand massage it would be the height of folly to say that thick layers of mucus loaded with food débris could be coagulated and caries prevented. The writer wishes to go on record as an absolute believer in prophylaxis as it is now practiced, and we can all pin our faith in the efficacy of elbow-grease and “clean up,” *but clean up will not do all*, as the following will show:

One of the most interesting developments growing out of the inquiries preparatory to this report was the fact noted by several “that those children receiving the most careful and regular prophylactic treatment were more liable to enamel decalcification about appliances than those only receiving a moderate amount.” *That apparently the more thorough the clean-up the greater the enamel decalcification.* This would seem to indicate a loss of something: that some protective process had been interfered with.

The writer believes (he does not ask you to believe) that the protective covering lost was the oral mucus; that by its thorough removal new surfaces were laid open to fresh carious infection; that had nitrate of silver been used after a day's mucus had collected, fresh cultures could never have prospered.

What he does ask of you is this: The Orthodontist's opportunity for observation as to the value of prophylaxis is unique, for he is daily noting the behavior of enamel, adjacent to which he has also made retention centers by placing appliances, and if the members of this Society will, by careful observation, confirm or deny the foregoing statement, *i. e.*, that enamel decalcification is greater near appliances after prophylaxis regularly applied than in those which are not so treated, he will be conferring an everlasting favor on the profession at large, for in this lies the very “crux” of the whole great and yet unsettled question of dental caries.

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### **Conclusion.**

That the noble metals only, are fit for appliances in the human mouth.

That while there is greater danger of enamel decalcification from noble than base metal appliance, this is only early in their application, and it may be met by intelligent prophylaxis, whereas the objections to the base metal can not be overcome, for the crypts increase and the whole appliance becomes a retainer of filth applied to the enamel.

That ligatures should be used as little as possible, if at all, and that appliances should be of the removable type, if possible.

That every retention center between tooth and appliance should be covered by protective bands.

That some gutta-percha preparation take the place of oxyphosphate, or be used in conjunction with it.

That prophylaxis is necessary, but will not alone prevent decalcification, and may induce it.

That silver-nitrate solution should follow the thorough Smith treatment by coagulating the buccal mucus, protects and does not stain the tooth enamel unless defects are of such depth as to call for operative procedure.

### **Discussion of Paper by Dr. Clarence Grieves.**

#### **Dr. Pullen.**

I am sorry I could not have had this paper to read in advance in order to keep in mind the particular points which the essayist makes, so as to be able to discuss it to better advantage. There are some things of which he has spoken which interest me exceedingly; *i. e.*, in relation to the practical use of the metals in the mouth. Many of the members of the American Society have been using the noble metals exclusively for the last few years, and they have found that by combining prophylactic methods with their operating, greater success has attended their efforts. Many problems present themselves which are difficult to solve, such as the proper prophylactic methods to use, etc. Again, in some cases, I have noticed staining from silver nitrate and did not know how to avoid it, but the technique which Dr. Grieves has presented to-day throws a new light on that matter. The nearer we can approach to an appliance which allows space between the teeth and the arches, without the use of many ligatures, the easier the tooth surfaces can be kept clean. I am very much in favor of having Dr. Grieves continue his investigations, and I recognize that he has already given us much that is of value in regard to the



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use of the noble metals in the mouth. No doubt the members will be glad to send him specimens from time to time and his report next year will again be invaluable to us.

I have not anything to say except to congratulate Dr. Grieves. His work is splendid and should have been taken up long ago, and we should be proud of having such work so thoroughly done for us. I am sure we are all deriving the greatest benefit from his researches.

Dr. Grieves has given us a most excellent paper and we will not want to dispute or deny the metal tests. However, since my clinical experience for over ten years has been such as to make me fear the universal use of noble metals for orthodontia appliances, and since this paper has not gone definitely into the alleged deleterious effects which may arise from the use of German silver, I can not see that we are much ahead on this subject. I have noted that a platinum appliance, soldered with pure gold, was often associated with decay. At one time when I had taken up the use of platinum and pure gold, especially for retainers, I thought that I had an excellent fixture for all purposes except spring wire, but, when decay came, in spite of the care of the patient and myself, I felt compelled to return to German silver for general purposes. I had noted superficial disintegration under gold-plated appliances and, therefore, used unplated German silver and the decay, even in neglected conditions, has been checked.

The doctor has said that "the metal salts taken up by the saliva and carried to the stomach prevent fermentation and undoubtedly cause great damage." That opens a comparatively new field. The experts at Johns Hopkins are only opening their eyes to the possibilities in this direction. German silver is an evil, but is not the noble-metal appliance advocated a greater evil? It is not yet demonstrated that gold or platinum is better than German silver for practical purposes and results in all cases. If we are to have decay under the noble metals, and must resort to silver nitrate, we are using questionably strong reagents in the mouth, which are liable to destroy normal conditions as well as the abnormal; we destroy or weaken the very resistive features desired. It has not been proven that the discolored German silver in the mouth is a detrimental agent. Let us not jump from the "frying-pan into the fire." We need little more theorizing and observation, and we then will get our practical metal for appliances.

I have noted where we have a German-silver band in place, for instance, on a molar, there is no decay occurring on the approximal surfaces. In that portion of the mouth there is no circulation; there can be

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no real prophylaxis. If prophylaxis under the gold appliance is to be efficient, it must be efficient at that point as well as upon the buccal and lingual surfaces, and if it fails in this regard the use of the noble metal is a failure. Our research must take this direction; it must find a metal, the slight disintegration of which must be at the expense of the metal and not of the tooth. It should produce a salt which shall be inert. That hypothesis does not call for all noble metals.

I wish to thank Dr. Grieves for what he has done. His work so far is of extreme value. My remarks are not to belittle his effort in the least. I would like to know the effects of the salts of the German-silver alloy upon the system from actual tests instead of from surmise. We need some investigation similar to the X-ray-bismuth tests on digestion.

I am glad I am called immediately after Dr. **Dr. Ottolengui.** Barnes, because I can not follow what he has said.

I do not believe that one thing he said in favor of German silver and against the noble metals is true. It was proven last year that there is a reason for not using German silver, in that it disintegrates and, therefore, loses its tensile strength. That is especially objectionable in retaining devices. As to gold appliances not holding their own, that is not true, because they are holding their own better than the German silver. I want to remind Dr. Barnes that Dr. Grieves pointed out last year that the disintegration of German silver discharges into the saliva poisonous doses of salts.

**Dr. Grieves.** That was my impression when worn for some time in the human mouth.

Someone wrote me a letter in which the contention was made that the quantity which Dr. **Dr. Ottolengui.** Grieves considered deleterious is really less than the medicinal dose of the salt. I wrote him that before publishing that criticism I would like to ask him whether he would not discriminate between giving his sick child a medicinal dose of a poison, and administering to his well child, one half of that dose daily, for an unlimited time I believe we do not know just what damage we do to the system by the constant exhibition of these poisons entering the system through the use of these metals. This alone would be a sufficient reason for discontinuing the use of any metals which can throw down such salts.

In regard to the decay of the teeth in contact with metals I think it has been abundantly proven that it is not the metal at all, but that the decay is invited by the creation of a retention center, and we may have the same conditions with any metal, in which case there would be the same extent of caries in that particular mouth. None of us has given Dr. Grieves the support which he should have had. He has not had

enough specimens nor sufficient data. In the specimen I sent him you will find it is not sufficiently disintegrated even to require a filling. It had been in the mouth a year prior to the request of Dr. Grieves that we give him such specimens. They were retention bands, worn for a year on the temporary molars. One of these bands had loosened and was lifted off; the other tooth was extracted with band still held fast by cement. They have proved interesting. The disintegration under the loosened band was superficial, and proves the need of a good cementing medium rather than an injurious influence of metal.

Another point to be considered (if you argue in favor of German silver) by any of you who use labial retention arches, is, what are you making them of? Are you using German silver? If you use the noble metals in this, the most conspicuous place in the mouth, you can use the noble metals anywhere. When I use such arches crossing the labial surfaces I allow them to come in contact with the tooth surfaces as little as possible, and tell the parents that I refuse to take the responsibility for any caries which might occur under the wires unless those teeth are cleansed by passing silk ligatures under these wires at every cleaning, and I demand that the teeth be cleaned three times a day or immediately after eating. It is not the metal which produces trouble; it is the lack of oral hygiene. In some children anything remains clean in the mouth. It is a serious question as to the care and cleanliness exhibited when any metal is kept for a long time in contact with the teeth. I think it advisable where the child is not cleanly, and can not be made cleanly, to take special precautions. In some mouths where there is an extra exudation of mucus of a mucilaginous character, which holds a detritus about the gum margin, I feel safer to use an iridio-platinum jacket, rolling the material almost as thin as that used for matrices for inlays. That protects the tooth from contact with the arch—not because the arch is of gold, nor German silver, but because in such mouth decay might occur with any metal used.

I would like to correct the impression Dr. Ottolengui has. I stated that noble metals were negative in their action. With German silver there is something which prevents decay. There is a question as to the effects produced upon some systems. I do use noble metals in the incisor and cuspids regions where cleanliness may be maintained, but I warn the patients that those teeth and bands *must be kept clean*.

**Dr. Ottolengui.** I contest that statement so often made. Neither Dr. Barnes, nor any other man, has yet *proved* that there really is "*something*" about German silver that prevents decay.

Will Dr. Barnes or Dr. Grieves tell me, if our orthodontia appliances

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invite caries, why do we not have caries along the approximal surfaces where we apply ligatures all the time? I have yet to see an approximal decay in either an incisor or cuspid of any child for whom I have been regulating teeth. But I have seen very much approximal decay in children who were not wearing any appliances.

**Dr. Barnes.** You have no circulation of fluids there, and the salts from German silver remain active.

**Dr. Ottolengui.** Then we should have caries when we use silk ligatures, which surely do not throw down metallic salts. Do you mean me to understand that if the teeth are not cleaned they are more immune to decay than where they are cleaned?

**Dr. Barnes.** Sometimes that seems to be true with base-metal appliances.

**Dr. Ottolengui.** The truth is, that the approximal surfaces are cleaned by placing or removing ligatures.

**Dr. Hawley.** It will require several years, I believe, for us to fully appreciate the work Dr. Grieves has done for this society. No man has done better work nor presented more valuable data to this society. I want to express my appreciation. He has established definitely certain things, and it will take long, careful and scientific observations to change those conclusions. All of my clinical experience has led me to practically the same conclusions which he has reached through his scientific investigation. The fact that German silver deteriorates in the mouth in retention, and during treatment as well, led me to abandon it before he gave us his results, and I have not as yet observed any more decay under gold appliances than I had observed under the German silver. From my observation I believe that any mouth that will not be cleaned sufficiently to prevent any deterioration of the enamel under gold appliances, should not be treated. Any child that will undertake such a course of treatment for a case of malocclusion must be taught to clean the teeth sufficiently to protect them under any appliances.

Gold has many advantages besides being free from throwing out deleterious substances in the mouth; precious metals are stronger and can be used thinner, and are more sightly. In comparison to using a large German-silver arch (and when you use smaller than 16 gauge in German silver you lose resiliency), we can use 18 gauge in gold and have great strength and resiliency. I think I have noticed, although I can not present any definite data, that the extreme prophylaxis; *i. e.*, the polishing of the teeth with pumice stone with the aid of orange wood stick, etc., during the orthodontia work, is not any more valuable than the thorough

cleaning with the brush, leaving some mucus and using nitrate of silver. I started some experiments with a solution of sticky wax, resin, etc., but unfortunately I was not able to collect those teeth finally through a series of neglect (some on my part and some on the part of the patient), but I intended to get a series of temporary teeth that would be lost, and coat them with these solutions, and see how long that would protect them. It remains on the teeth for a long time, can easily be renewed at intervals of a month or two, and I believe it would be of great value. I have lost all fear of any deleterious effect from the noble metal appliance. If the child can not be taught to keep the teeth clean there is little use in treating the case.

**Dr. Remple.**

I believe the two papers Dr. Grieves has presented are among the most important that have ever been read before the American Society of Orthodontists. Dr. Grieves started to investigate a problem along purely scientific lines. He did not begin this work with the purpose of advocating the use of any particular metal or alloy, but has simply been making a series of investigations to find out what possible effect the saliva may have on those metals commonly used in the construction of regulating appliances, and if possible what protection from decay the teeth may receive from the salts thrown down by those appliances during orthodontic operations. He has also shown in his last investigation that the salt of copper is not proven to be a preventive of caries of the teeth, as has been claimed. What the physiological effect of the assimilation of small quantities of zinc—which have been found in the saliva of patients wearing the German-silver appliances—may be, he does not know. None of us know, and it is up to the physiologists to determine it. Possibly the idiosyncrasies of the patient may be such that a very small proportion of these salts may be injurious.

We have all heard of one or two patients who have been more or less ill while wearing regulating appliances, the illness being of an obscure origin, but upon removal of the appliances the patient immediately improved in health. Such conditions may not result from wearing the appliances; they may be only coincident; but of this we are not absolutely sure: it is a problem to be solved by the pathologist. However, if such idiosyncrasies do exist among our patients making it possible that even one in a hundred, or even one in one thousand, is liable to suffer from metallic poisoning by wearing regulating appliances, we, as orthodontists, want to know. Its effect may not be manifested at all in the great majority of patients, but if the assimilation of zinc is injurious to one patient in a thousand, how shall we tell which patient it is? Up to date we have not an ideal metal for appliances, and Dr. Grieves wishes the

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investigation to be carried further. In regard to the production of caries in a mouth that is neglected (and I believe Dr. Grieves will confirm this, or did confirm it in the paper at Washington), the tendency to decay is less where German-silver or base-metal appliances are used than in a mouth where the noble-metal appliances are used. It has been my observation that in a mouth which is kept ordinarily clean (as the better class of patients usually keep their mouths), there is very little, if any, more tendency to decay with the noble metals than there is under the base metals. So far as the working of the metals is concerned and the cleanliness of the mouth, it is of advantage to both patient and operator to use the noble metals. Experience has shown that the German-silver appliances in use are not composed of an alloy to give permanency. Recently a patient telephoned me that an appliance had come off. She had been away—in Europe—for a number of months, and she came to me to have the appliance replaced. Both of the upper molar bands on the approximal surfaces were disintegrated to such an extent that they simply dropped to pieces. You could not handle them without parts crumbling off. It was not a disintegration of the cement, but of the metal itself.

I just want to express my hearty appreciation of the effort that Dr. Grieves has made to arrive at the truth. He has not been opposed to German-silver appliances, nor has he advocated the use of noble metals. He is seeking for facts from an unbiased and unprejudiced standpoint.

**Dr. Munroe.** I would like to give an experience I had in the use of the German-silver appliances after having had the patient wear the appliance for a period of about eight months. While the orthodontic work went along very nicely, the patient became affected in some way which we could not exactly explain, and upon the advice of the family physician—not seeing any other cause after examining the case very carefully—the appliances were removed. The boy had been affected with something bordering upon epilepsy, and on the removal of the appliances the patient commenced to recover. Whether it was the nervous tension on the child or whether it might have been the result of the salts deposited in his system from the appliances, I do not know. I have not yet resumed the work in this case.

I have also lately noticed, in regard to the immunity from caries in the mouths of patients, that sulphocyanate of potash has some effect: the degree of immunity is in accord with the amount of the potash. Can Dr. Grieves tell us if that would be true in the mouths of patients who wore the appliances where decay is present?

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**Dr. Hawley.** I presume all the members are now familiar with the use of the so-called grass line, or raw silk, but I will say that the longer I use this grass line the better I like it. In connection with the noble metals it has no staining effect. I like to use as few ligatures as possible, and will show a device in the clinic which does away with a number of ligatures. A few days ago I had occasion to remove a grass-line ligature that had been overlooked and had been in the place about nine months, and the tooth was not injured, nor was the ligature disintegrated. It is a much more permanent ligature than I had supposed.

**Dr. Remple.** In regard to ligatures, and particularly in regard to the so-called grass-line ligature, I would like to say I have had a number of cases where I attempted to rotate the lower incisors with the silk, and in mouths where there is slight tendency to caries, I have found, upon the removal of one of those ligatures which may have been in place for two or three weeks, the enamel bleached, forming a line just under the ligature. This bleaching was not sufficient to cause caries in that length of time, but enough to warn me that I could not leave silk ligatures on those teeth. I have not had this occur with any teeth except the lower incisors. I have noticed it, perhaps, a half dozen times, or more. I just wanted to call attention to that because a number of the members have spoken about leaving the ligatures on the teeth for quite a long time without any injury. I do not think that can be done indiscriminately without injury to the teeth. If whitening of the enamel is shown even in three to six weeks, I think we should be cautious with the silk ligature.

**Dr. Dunn.** Since Dr. Grieves's paper was presented last year, I have been trying both the noble metals and the German silver. I am favorably inclined to the noble metals, and yet I am not prepared to-day to give up my German-silver appliances. I think there are cases where each metal is indicated, or that each appliance should be made of German silver or of the noble metals entire. In one of my worst cases where there was disintegration, noble metal appliances were used. In no case where German silver was used did I have any such experience.

**Dr. Remple.** Have you not seen similar conditions in the mouths of patients who were not wearing any appliances?

**Dr. Dunn.** Yes, I have seen the same condition; but I believe in this instance the appliances were in a measure to blame.

**Dr. Remple.** Perhaps that is a coincidence.

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**Dr. Dunn.** The disintegration of the German silver is proven, but I have not had my appliances disintegrate to the point where they have been a detriment. From the esthetic standpoint that feature is against them.

I can not see any advantage in silk ligatures, except in certain places, as in the rotation of incisors, where they are in slight torso-occlusion. Dr. Grieves spoke of using removable appliances, and not using ligatures of any sort. I do not believe the time will come when we can do that. We will always be compelled to use ligatures and stationary appliances in the mouth.

**Dr. Grieves.** I appreciate very much your consideration of the paper I have read, and I want to thank those members who have asked me to go on with the work. I feel I am at the "end of my string!" I have had the best help I could get in chemistry from others. If I had been a biased man and opposed to German silver, I would simply quote Dr. Ferris's statement, where he refers to seeing crystals of copper sulphate, and let it go at that; but I think that will hardly do. I hope you will not think I am biased either way, and I am not an orthodontist.

Relative to the amount of waste, we certainly know that the saliva is wonderfully changed. You know the filthy mouths of orthodontia patients, and if you will collect saliva of your own or of your patients and keep it over night, and then think of keeping it three months, as I did, it will speak for itself. When you find saliva reeking with filth and food and not decomposing, something has happened to it, and the thing that has happened to it is so profound as to completely change its character so much so as to affect the ptyalin or the enzymes in it. That point must be recognized. I have the verbal assurance of a good physiologist that ptyalin, on which we depend for digestion of starches, has a full two hours in the esophageal end of the stomach to do its work. Any thing which will interfere with the ptyalin digestion is no small matter. We are sure that German silver does waste. It has been proven by weight and by experience, *and the waste which we can gather from the appliances and from the teeth is absolutely inert as a bactericidal agent.* Sulphides of copper, with the containing filth, were put in the culture and a growth was secured from the scrapings. If we want salts formed, we are not getting them in a germicidal way from German silver, as was stated last night and proved this afternoon. As to the ingestion of the waste metal and what harm it might do, we may swing first to the one side and then to the other. I quoted cases where there were serious systemic conditions, and where, upon the removal of the German-silver appliances, those systemic conditions ceased. It may have been coinci-



dence, and it may not have been coincidence. But we know the metal wasted. The *physician ordered the removal of the appliance, however*. I have been "right up against" that proposition and know how I felt in view of the fact that we are teaching and practicing prophylaxis and still put something in the mouth which the physician has to order out. If we pose as "one end" of the medical profession, and use something which, when removed, seems to allow the sick patient to recover, we might better not use that substance thereafter.

As to prophylaxis, Dr. Barnes has mentioned the fact that German silver does no more harm than gold. I found that when gold was first put in the mouth the damage was done. There was no damage when German silver was first placed in the mouth. After the end of the first month we may have decalcification of the enamel beginning, and it increases until more damage is done than when the gold is used. Of course, we had more cultures applied directly to the tooth by the band than from smooth, clean gold, or noble-metal appliances free from zinc.

Twenty karat platinous gold with zinc degenerates. I mean, therefore, by noble-metal appliances, such alloys as gold and platinum with copper or silver, but no zinc or base metal. Why should we clean teeth if we place bands on them to degenerate and get filthy?

Relative to the salts ingested, the work I reported last year shows the nickel can absolutely be neglected, German silver being copper 2, zinc 6, and nickel 1. There was one case of an adult suffering from pernicious anemia that my own physician showed me, where the appliances had been on three years, and after removal of same the patient recovered. It may have been coincidence. The appliances were much damaged. In the case of a daughter of a member of this society the symptoms were colic, constipation and diarrhea. As to the absorption of copper, it is taken up directly by the membrane, thence attaching itself to the red blood corpuscles, and finally lodged in the liver. It is a normal constituent of some foods, and ingested in that way it does no harm. In the case of brass-founders' ague, the patient becomes green, has colic, chorea, and a general breakdown of the *central nervous* system and interstitial membranes of the kidneys, by which it is excreted.

I think I have answered all the questions, and the reason I suggested the nitrate of silver was that I really believe it is a good thing, and Dr. Barnes must not misunderstand me. I did not say it must not be used by the patient. The teeth may be left one day: remove all the detritus and mucus and let them rest a day for the mucus to accumulate, and then make the application.

**Dr. Barnes.**

What about the interproximal spaces?

## ITEMS OF INTEREST

**Dr. Grieves.** I do not know how they would ever be approached by prophylaxis anyway. That is no argument against prophylaxis. How do you reach those places ordinarily? You do not. Silver nitrate is just as effective, and you will need it more than if you use gold, because the German silver is plated.

**Dr. Munroe.**

What about the sulphocyanates?

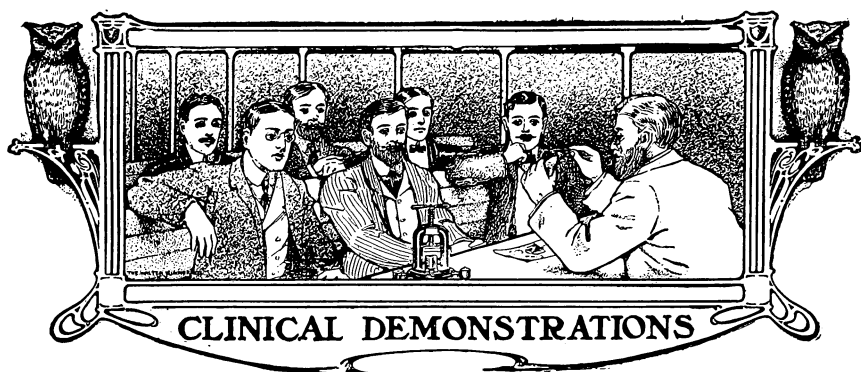
**Dr. Grieves.** These have been worked out by Dr. Beach and Dr. Lowe, and they have been giving the sulphocyanates. It has been proven, I think, that from two to five per cent. of sulphocyanate, potassium or sodium, in the saliva will prevent decay. As to the administration of it I do not know offhand.

**Dr. Munroe.**

Would that hold good with the appliances in the mouth?

**Dr. Grieves.** I can not say more at this time. I think it has been proven that gold is clean and should be used, and that German silver at first may have some deterrent action, and later it does more harm than gold. The salts from German silver do no good, and they might do great damage. In conjunction with the prophylactic measure of using the silver nitrate the practical results have been worked out, and I particularly ask you to note whether you have degeneration after perfect prophylaxis, more than you had before. You are in a position, gentlemen, to study the beginnings of caries: that is something we know nothing of. You can see these patients from day to day and week by week. You are in a position to solve that, assisted by a little chemical work as it may be worked out by someone more able than I in organic chemistry.





## **Clinics before the American Society of Othodontists.**

**A Retainer**

**By Howard D. Keeler**

**Des Moines, Iowa**

A new method on attaching a lingual arch bar to bands on teeth designed to hold and support same. It is my opinion that a retaining appliance, which is not rigid, and one which will do what is required of it, is far better than an appliance which is essentially rigid, that is, with soldered attachments of bars to bands. In this appliance the connection between lingual arch bar and bands is made by means of tubes (very small) placed on arch and soldered to bands which are to support the same. This makes of each attachment a hinge joint instead of a soldered rigid connection.

Bands of 22 k. gold, 36 gauge (or of platinum) are made for such teeth as are selected to hold the retaining bar. These bands are placed in position of the teeth and the impression taken. Remove bands and place carefully and accurately in impression and fill with investment material; separate and you have model with bands in their relative position.

Select a lingual arch bar, usually iridio-platinum wire, number 18 gauge, and make tubes that will fit. Make tubes in following manner. Take piece of 22 k. 36 gauge gold and cut strip about one tenth of an inch wide. This will be length of tube. If you wish tube longer or shorter cut strip accordingly. Anneal well and roll on the iridio-platinum bar, which will make the tube. Two or three times around is sufficient for strength. Remove from bar and flow in a little 20 k. solder, taking

care that the solder does not flow within the tube. Make as many tubes as you may wish for your case in hand.

In making an elaborate retainer, such as is shown in Fig. 1, bend bar to fit case, placing a tube opposite or against each band and solder tube to band, taking care again that the solder does not flow within the tube, which would make a rigid joint. Paint surface of bar within the tube with whiting or rouge to avoid this. Solder tubes to band with 18 k. solder. If bar extends back to molar, make rigid attachment at that point. I make many of these with but two attachments, that is, on both cuspids.

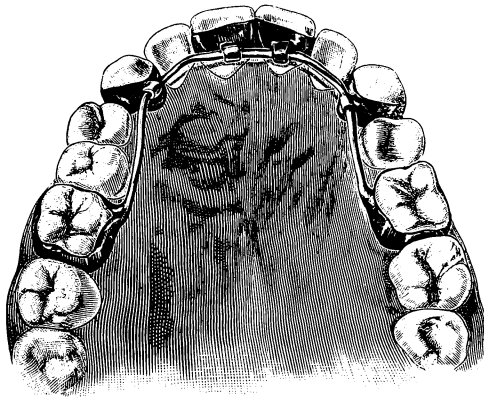


FIG. 1.

If arch has been expanded and anterior teeth moved mesially, this retainer is sufficient. In these cases there must be quite an angle (as near as possible to right angle) in arch bars at region of cuspids and tubes placed exactly in the angle, else there will be some slipping distally as there would be no attachment to molar bands, the lingual bar extending distally only as far as second bicuspid.

There are two features about this retainer that I wish to bring out. First, ease with which it can be inserted, especially as it is indicated where there is much or great diverging of the cuspids. Over some of the cases of slanting cuspids it is almost impossible to place a rigid retainer. Second, with the hinge joints, the apices of roots, instead of being immovably held by a rigid retainer, are permitted to work forward. In many cases there is much inclination of roots, and we want a retainer that will allow these teeth to "straighten up," under lip pressure.

## ITEMS OF INTEREST

**Working Retainer;  
Skeleton Bite Plane;  
Elevating Bicuspids;  
By J. Lowe Young  
New York**

Figure 1 shows what I have termed a "working retainer," owing to the fact that the point of contact on the lingual surface of the upper front teeth is so high that the constant pressure of the lower lip on the incisal third of the labial surface will act as a lever and cause the apices of the roots to move forward stimulating bone development.

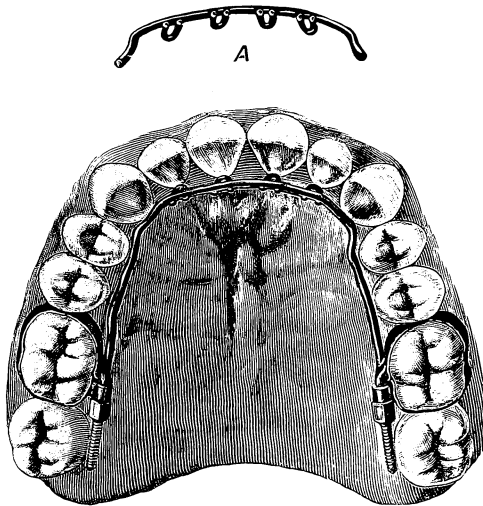


FIG. 1.

This form of retainer has proved very valuable in cases where there is pronounced lack of bone development in the upper incisor region. It is also inconspicuous.

The lingual wire is of iridio-platinum, nineteen gauge, while the small U's shown at A are of iridio-platinum, twenty-five gauge, soldered to the base wire with pure gold.

It is very necessary that these U's be made of light wire so that they may pass well up under the gum without causing irritation, and also, that if found necessary they can be readily bent for any final adjustment without disturbing the base wire.

Figure 2 shows the skeleton bite plane which has proved of value in the retention of Class II, both first and second divisions, where the molars and bicuspids are in infra-occlusion. The soft tissues under such

## ITEMS OF INTEREST

a bite plane are far less liable to become inflamed and hypertrophied than when a solid bite plane is used.

In the construction of this retainer the lingual base wire is fitted first and then the other piece bent to fit approximately and one end

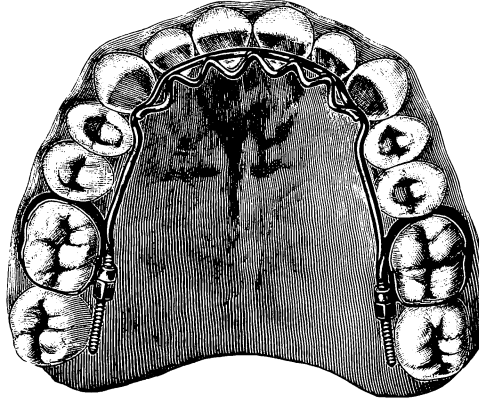
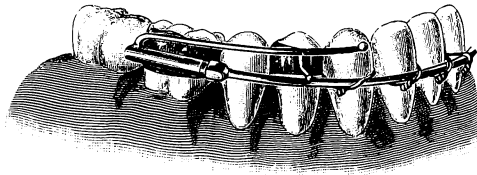


FIG. 2.

soldered to the lingual wire with pure gold. The next contract point can be made to rest tight on the lingual wire and soldered and so on throughout.



*FIG. 3.*

Figure 3 shows an auxiliary spring of clasp-gold soldered to the buccal tube of a clamp band and extending forward to the cuspid region. This has proved a very satisfactory method of elevating the bicuspid and cuspids in cases of infra-occlusion. The teeth to be elongated should be fitted with plain bands having a spur that the wire may be sprung over or ligated to them, as desired. The arch which is ligated to the anterior teeth prevents the tipping of the molar during the use of such a lever.

## ITEMS OF INTEREST

**Extension Tooth Movement,  
Split Tube Attachment,  
Lingual Attachment for Clamp Bands,  
By C. A. Hawley,  
Washington, D. C.**

Understanding that there is considerable interest just now in the question of how far, and under what conditions a tooth may be moved without danger of death to the pulp, I brought with me some slides of a case that is interesting from that standpoint. The first (Fig. 1.) shows the appearance of the teeth of a nine-year-old boy from the labial aspect. The next (Fig. 2) study models of the occlusal aspect of the teeth at the beginning of

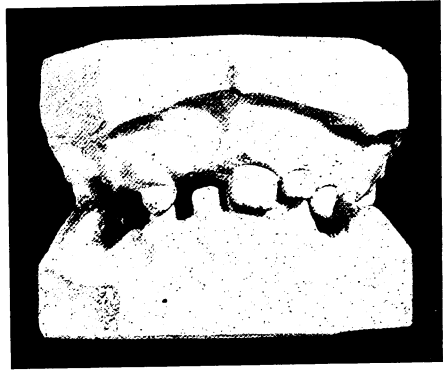


FIG. 1.



(a)

(b)

(c)

FIG. 2.



FIG. 3.

treatment, at the stage when the labial movement was accomplished, and at the conclusion.

The right central incisor had erupted nearly in the center of the palate, about on a line across the first bicuspids (a). It was drawn labially to the line of occlusion and rotated, its incisal edge at that time

## ITEMS OF INTEREST

being about level with the gums (*b*). It was then removed down to the same degree of eruption as the other central (*c*). The last movement is shown in (Fig. 3). It was then retained in position and at the end of three months, there having been no evidence of pulp disturbance an X-ray photograph was taken (Fig. 4) which indicates a fully formed root and healthy pulp.

Figure 5 shows a modification or development of the square tube



FIG. 4.

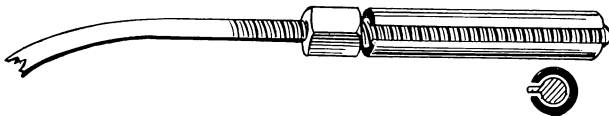


FIG. 5.

device first described by Dr. Kemple, the modification being suggested to me by Dr. Abell. This modification consists in the use of a round split buccal tube, the split portion of which engages with a lug of plate or wire soldered on the expansion arch, thus preventing the expansion arch from turning in the tube, and consequently providing for the bodily movement of the molar used as anchorage. It appears to me that this device is just as effectual as, and easier of adjustment than, the square tubes used for the same purpose.

Figure 6 illustrates a combination of my own for obviating the necessity of ligating the bicuspid during the first stage of treatment at least, and for adding stability to the expansion arch so that it will not



## ITEMS OF INTEREST

need as frequent attention as in the usual method of ligating all of the bicuspid to the expansion arch. This combination consists in the use of a lingual wire extending from the mesial angle of the molar clamp band to the distal angle of the cuspid on each side, the bicuspid being banded with lingual hooks engaging with the lingual wire, and with buccal eyelets attached to the bands in the buccal embrasure for engaging the ligatures from the expansion arch. The lingual wire may be extended to the mesial

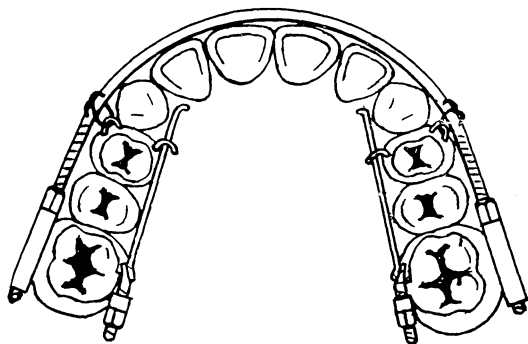


FIG. 6

angle of the cuspid which is banded in a similar manner when the indications of treatment warrant it.

The advantage of the arrangement is that, during the first stage of treatment while the arches are being widened, there are no ligatures required back of the cuspids. The lingual wire carries out the bicuspid and cuspids or in young cases the temporary molars and cuspids without the irritation of ligatures around the teeth. The short one from the little loop to the arch is not likely to get loose. I have had some cases go over the summer without any attention and nothing got out of place.

### **Widening the Molar Region, By Rodrigues Ottolengui, New York.**

In widening the molar region, using the expansion arch, it has often been noted that there is danger of tipping the molar crowns buccally. This will either "open the bite" or throw the tipped tooth out of occlusion. The exception would be where the molar at the outset might be tipped abnormally toward the tongue, in which cases the "bite" is commonly too close, a fact easily proven by observing that the overbite in the incisive region is too long. In such cases by tipping the molar buccally the tooth is lifted into an erect position, and brought into normal occlusal relations, while coincidentally the too long overbite is corrected.

## ITEMS OF INTEREST

Thus it is seen that at times it is desirable, and at other times undesirable, that molars should be tipped during the process of moving them buccally. Such tipping depends wholly upon the opportunity for the metal arch to turn in the buccal tubes, and to prevent or modify this possible turning several orthodontists have devised various mechanisms.

Perhaps the most efficient heretofore suggested, has been the square tube presented to the profession by Dr. Fred. C. Kemple. In this apparatus the buccal tube is square instead of round, and a second, smaller square tube is soldered at the extreme end of the arch. This smaller tube is made to exactly telescope the larger buccal tube, and by preventing rotation of the arch within the tube, modifies the buccal movement of the molar, practically preventing tipping, and thus compelling the bodily transit of the tooth. A molar treated in this manner offers greater resistance to stress, than where the round tube is used, and consequently the square tube offers an excellent anchorage where the molar on one side alone is to be carried buccally. In such cases the square tube may be placed on the tooth which is already in normal or nearly normal pose, while a round tube may be used on the opposite side where the tooth may be in lingual occlusion.

I have had excellent results with the Kemple square tubes, and am still using them where I know at the outset that the molars should be moved little or not at all. But occasions arise where we wish to move the molars somewhat, and will then desire to prevent or control further buccal movement or tipping. And for this purpose I am pleased to present a device which is but a slight modification of one shown to me by Dr. Hawley.

Dr. Hawley used a round buccal tube and this tube was split throughout. To the arch he soldered a short lug, which, sliding in this split tube would somewhat prevent rotation of the arch in the tube. I can not see any advantage in this appliance over the Kemple tubes, and indeed I do not believe that it prevents rotation to the same extent as does the square tube. Moreover, the Kemple tubes seem to me more easily adjusted. However, the Hawley appliance suggested to me the following:

Figure 1, in the the larger drawing, shows the complete appliance in place. The split in the tube is here seen to be presenting toward the morsal ends of the teeth; but this is done solely for the purpose of illustrating it. In practice I prefer to attach the tubes so that the split presents rootwise.

The usual arch (a) is used. The buccal tube (b) is round and has a split throughout its complete length. Over the end of the arch I use a smaller tube (c) which exactly telescopes the larger buccal tube, and to which is attached a round wire lug wich engages and slides in the slot

## ITEMS OF INTEREST

in the split tube. This small tube (*c*) is threaded so as to screw on to the end of the arch. This affords several advantages. It allows of its use without being soldered, and when the telescoping tube is not soldered it serves as a friction collar to steady the arch in the tube while at the same time permitting rotation of the arch within the tube. Thus, when the telescoping tube is not soldered to the arch, the molar may be tipped outwardly. When it is soldered, rotation of the arch within the tube is to an extent prevented and the device operates on the same principle

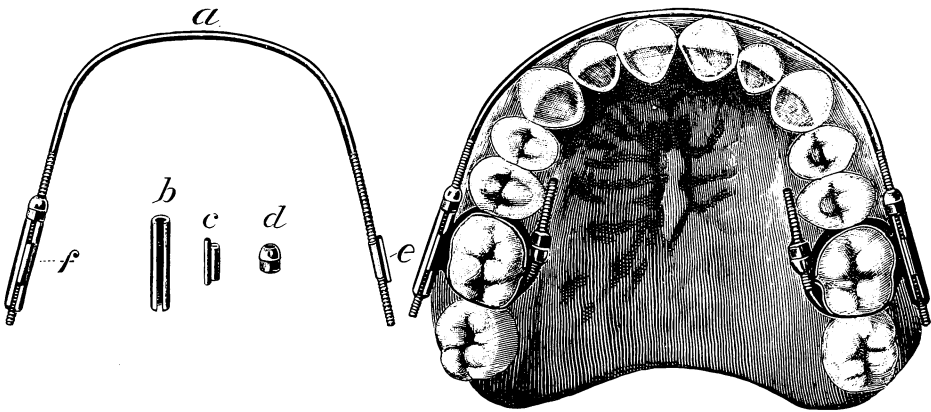


FIG. 1.

as the Kemple square tube. At (*e*) we see the telescoping tube and lug screwed on to the arch, and at (*f*) we see the same, with tube and nut in place. The nut (*d*) has one-half of its extent left round. In use it is not so convenient as the square nuts, but it resists the action of the cheek and tongue to turn it.

The advantage of this device (if there is any) is to be found in the fact that the appliance may be operated either as an ordinary round buccal tube, or on the principle of the Kemple square tube. Thus a case requiring widening in the molar region may be started with the telescoping tube (*c*) simply screwed on the arch. As soon as the desired width across the molar region has been obtained a tiny bit of soft solder firmly attaches the lug to the arch, and thenceforth we have the action of a square tube. It may happen that one molar may move more rapidly than its fellow on the opposite side. In such case one telescoping tube (*c*) may be soldered to the arch and the other left loose till the other molar is in the position desired.

## ITEMS OF INTEREST

### **The Northcroft Plaster Plane** By Dr. Hedley C. Ustick London, England

This plane is designed to be a time-saver to the orthodontist. With it a pair of models may be trimmed up by a novice in about one third the time usually required.

The apparatus which is here shown consists of a scribing-tool, an adjustable rubber-padded tripod, a shooting-board, a bronze plane, and a piece of plate glass.

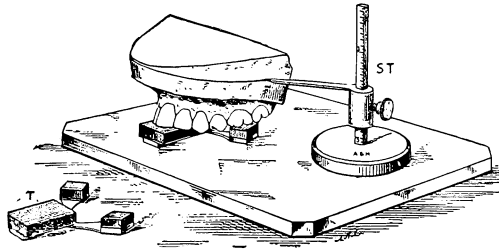


FIG. 1.

S T—Scribing-tool.      T—Tripod with Adjustable Rubber Pads.

1. The scribing-tool, instead of being made, as is usual, of steel, is made of brass, nickel-plated, to prevent rusting, and is marked on the scale in one-sixteenths of an inch (of course millimeters could be used equally well), the scale starting from the same level as the upper surface of the rubber pads on the tripod.

2. The tripod has adjustable rubber pads attached to it to prevent damage to the plaster teeth, and is calculated to support any model, from the smallest to the largest.

3. The shooting-board is designed with an adjustable angle-piece, with which to produce the two planes that are at 135 degrees to the back; also, with a step to facilitate the cutting of the angles without injury to prominent teeth..

4. The plane is a modified "jointer plane," made of gunmetal or bronze to prevent rusting, the blade being phosphor-bronze, which is especially tough.

5. Plate glass is used to facilitate the use of the scribing-tool in combination with the adjustable tripod, but any really flat surface does equally well. The glass is not supplied with the outfit.

Their method of use is, briefly, as follows:—

## ITEMS OF INTEREST

The model having been cast and separated, the "natural" portion at its greatest depth (say from the tip of the canine to the bottom of the sulcus above the canine fossa) is measured off on the upright bar of the scribing-tool, to which a third of this depth is added; then the whole distance is marked off from the base of the tool by the adjustable pointer.

The model is now inverted on the tripod, and so arranged that the two first molars, or second temporary molars, if the permanent teeth have not erupted, and the centrals only, are touching the rubber pads; a line

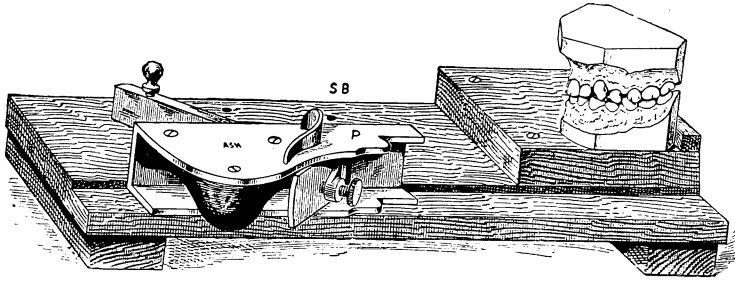


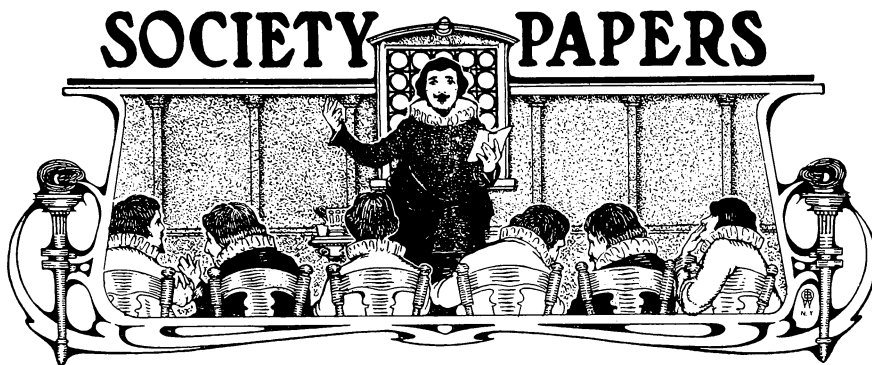
FIG. B.

S B—Shooting-board      P—Plane.

at the height indicated by the pointer of the scribing-tool is then scribed round the base of the model, to which line the base is cut away by the plane, the back edge having been previously made moderately straight to enable the model to be held firmly on the bench or board.

Having obtained a smooth base, the model is placed on the shooting-board. First the back edge is cut at right angles to the median line. Then the back corners are cut off at angles of 135 degrees to the back, as indicated by the movable angle-piece on the shooting-board, so that the back surface of the model terminates on either side at a point opposite the median sulcus of the last tooth—in other words, at a point which should correspond with the buccal cusps of the lower teeth. Then the sides are cut parallel to the molars and premolars on either side, up to, a point opposite the middle of the cuspids; from that point the model is cut forward on both sides to a point opposite the median line.

The same method is adopted with the lower model, except that the front is cut on a curve from cuspid to cuspid, the back finishing on either side in line with the buccal cusps of the lower molars.



## Practical Details of Cast Gold Inlay Work.

By JAS. G. LANE, D.D.S., Philadelphia, Pa.

*Read before the Central Dental Association of Northern New Jersey.*

We are indeed living in an age of exceedingly rapid advancement in the arts of our profession. It is also an age of fads and fancies—and dentistry seems to be quite as liberally supplied with fads as any other professional or business calling. Some new methods and operations that are thus sprung upon us from time to time possess extreme utility and merit. Others do not seem to embody the same requisites. Concerning the wisdom of taking up with all the new fads that are brought out in dentistry, the sentiment or advice of the immortal Alice Cary might seem to apply viz.:

"In words as in fashions the same rule will hold,  
Alike fantastic, if too new or old;  
Be not the first by whom the new are tried,  
Nor yet the last to lay the old aside."

In years gone by we have been slow to adopt and try out many things that, on the surface, looked plausible and rational, because with a very little deeper research there would reveal a fatal stumbling-block immediately ahead. The present art of casting gold should not be included in the category to which belongs the advice of the foregoing stanza. It brings to us a marvelous improvement on an already thoroughly tried and standard dental operation—the making of gold inlays. The improvement consists in obtaining an adaptation of the inlay to the cavity walls that had hitherto never been approached or even dreamed of, nor is its usefulness confined to the making of gold inlays, but of the other various operations possible with the process it might be said "their

name is Legion." It is no careless man's method. It must not be assumed that, inasmuch as perfection seems to go hand in hand with the method, that perfection of results would be certain in spite of indifference. Far from it. Every step depends for its merit on the excellence of the preceding step.

To Dr. William Taggart is certainly due the thanks and recompense of our benefited profession. The process he has given us is one into which we can enter without fear of results, because if results are faulty, the fault lies with us and not with the process.

Of the many casting machines now offered I would prefer an air machine—one that forces the gold into the mold by means of compressed air or compressed gas. By this arrangement the force used can be accurately measured and determined at all times. This adds to the certainty of results, which feature is one of utmost importance. It should not be necessary to make two or three patterns of a given case while we have the patient present in order that we might from the lot succeed in getting one casting. There is not a very wide margin between too little and too much pressure. Too little means a casting with imperfect corners and margins, and too much means a split or distorted mold, and, therefore, an imperfect casting.

The minimum pressure is limited by the resistance met with in changing the gold from its spheroidal form such form as the mold in the investment may have, and also the resistance met with in forcing it through the sprue. The maximum is limited by the strength of the investment. Approximately fifteen and thirty pounds, respectively; and these further depend upon the shape or complexity of the mold in the former, and the merit of the investment in the latter.

Much difficulty has been encountered in obtaining a suitable investment material. The condition that too frequently occurred was the splitting of the investment, even though the pressure applied in casting was not excessive. There were two factors which allowed this: an investment that was too weak, or one that contracted so much under high heat that it was not supported by the flask, and was thus unable to withstand the bursting strain to which it was subjected.

We think that at the present time the question of investments is taking precedence over all others.

There are certain fundamental requisites that an investment must possess. It should be so compounded that it will neither permanently expand nor contract under the intense heat to which it is subjected; it should set rapidly, so that in emergency cases long delays would be avoided, but not so rapidly that its manipulation would be uncertain. It should be so

#### **Investments.**

## ITEMS OF INTEREST

fine-grained that a smooth surface would be imparted to the gold, and on that smooth surface no residue remain that would be difficult to remove. It is an easy matter to mistake extreme expansion of the flask for contraction of the investment. When heated the flask takes the heat more readily than the investment. The flask, being a good conductor, and the investment a poor one, allows this condition. Thus, in the earlier stages of heating to burn out the wax pattern, a good investment might exhibit what would seem to be contraction by showing a space between it and the flask. A brass flask expands very much when heated, and an investment should expand just as much with an equal increase of heat; but, as has been stated, during the heating process the flask becomes much hotter than the investment and is likely to show a line of space. If, however, the source of heat be removed for twenty or thirty seconds, allowing the two to even up their different temperatures, the investment should fit tightly in the flask. It is not necessary to have a flask so exceedingly hot while casting, except there be present in that flask porcelain teeth or pieces of gold or platinum that are intended to be picked up by the casting. The presence of the former requires a high heat to prevent checking, and in the latter case a homogeneous union is not effected except at a high temperature.

We do not consider it good practice to cast against porcelain unless there is no other convenient means of making that union. The only particular feature to be observed in casting against porcelain is that the flask and porcelain shall have a temperature almost as high as the molten gold at the moment of casting. This is to prevent any sudden change of temperature in the porcelain. But there is always a possibility of checking the tooth regardless of the merit of the apparatus or dexterity in its manipulation. Present dentistry is trying to get away from the necessity of heating porcelain. The backings for Steele's interchangeable facings can be set in position in the wax and picked up nicely in the casting, and the facings thus utilized without heating.

For ordinary inlay work I prefer 24-karat gold.

### **Selection of Gold for Inlays.**

The only argument that could be advanced against its use are its malleability. The "too soft" masticating surface that might seem to be brought about by the malleable condition will not be too soft at all if it is properly finished. This same physical condition (namely, malleability) of pure gold gives us a most valuable adjunct toward the protection of the cement line, through the possibility of burnishing the margin of the inlay. Occasionally, of course, under certain conditions, or where its use seems to be indicated, I would use an alloy of gold to get a harder surface, or if the inlay was to be used as a bridge anchorage, but such cases are exceptional.



I do not sanction the use of "scrap gold" in any casting operation. Gold that has lost its identity is in no way suitable for inlay work. We can not be sure of proper results unless we always know exactly what we are doing. I prefer to use an oxyhydrogen blow-pipe, not as a necessity, but as a great convenience toward facilitating the work; and in order that it may be a means of general utility, it should be a hand blow-pipe, and in no way connected with a machine.

A smoother casting is obtained if the investment has been allowed to remain some hours before heat is applied. Casting can be accomplished in thirty minutes from the time the pattern is flaked, but the resultant casting will not be nearly so smooth and perfect as if its investment had been allowed some hours to harden. It should be allowed to remain until no free water is driven off in heating it. If water is driven off in heating, this carries away in solution some of the more soluble salts of crystallization, and the proportion of our investment, as a whole, is changed and weakened. Its surface is liable to undergo a slight disintegration when the melted gold is pressed against it. It therefore follows that when an exceptionally fine casting is desired, additional time must be given.

#### **Limitations of Casting.**

The entire art and manipulation of the casting process is so enticing that the faddist or hobbyist may be carried away captive by it, and before regaining or controlling his senses may find himself putting castings almost everywhere. The same condition has followed the adoption or application of every new method that we have had. The casting process can not be accepted as a general panacea for all cavities that are to be filled, or all crowns, bridges, and metal plates that are to be made. Far from it; notwithstanding the fact that assertions equivalent to this have been made and are being made. It therefore becomes a matter of judgment on our part to properly select our cases. Our decision in regard to selection, cavity preparation, anchorage, etc., must be based on scientific reasoning. Indifference or insufficient attention to details in these may be the means of scoring a failure which otherwise should have been a success. It must not be assumed that gold castings can be easily made to take the place of all gold fillings. It takes almost as long to cast and insert a small inlay as a large one, and very much longer than to put in a small gold filling by some other method. Most of the cavities in the anterior teeth can be filled more expeditiously by some of the older methods. However, if the cavity be a large one, or the tooth weak or of poor quality, the use of an inlay is indicated. It is a well-known fact that a gold filling is, from a therapeutic standpoint, the very poorest filling we can insert. No immunity is rendered to the tooth

## ITEMS OF INTEREST

structure by its presence except that its efficiency as a tooth saver depends upon its being a water-tight, air-tight, and gas-tight plug. Its insertion into a large cavity exerts a terrific bursting stress on the surrounding tooth structure, and may be the cause of fracture. It is also a well-known fact that fillings of the so-called cements do possess therapeutic properties to a remarkable degree and that the interior of a properly prepared cavity covered with it is rendered thoroughly immune as long as it remains covered. Its being put in under no pressure is subjecting the tooth to no undue strain or force by its presence, and by reason of the peculiarity of its make-up, hermetically seals the cavity. The only feature which the repair lacks is permanence in the cement itself. The inlay process comes to our rescue beautifully at this juncture and gives us the therapeutically perfect repair, the surface durability of gold, and no permanent pressure.

In deciding whether a gold filing or a gold inlay be indicated, there are certain factors that must be taken into consideration. Briefly considered, we would say that if the cavity is large, or in poor tooth structure, or in the tooth of a very young patient, or in such position or so inaccessible as to make the possibility of a perfect foil operation at the cervical margin improbable, an inlay is best. It must not be supposed that the gold inlay will take precedence over the porcelain inlay where the use of the latter is indicated for esthetic reasons. Granting that a porcelain inlay never fits as well as a gold one, it still retains its favor wherever conspicuous.

### **Casting Prosthetic Pieces.**

After the first few inlay machines were placed on the market, there seemed to be a sort of craze for larger flasks and the possibility of larger work, casting of plates, etc. This feature can very easily be carried to excess. It is not practicable to attempt to cast a gold base for a full upper, or lower, or partial lower denture. Cast gold does not possess the same rigidity in a plate as would obtain in the same bulk of plate if laminated by rolling or beating. The former would, therefore, have to be made much heavier to give the same strength. A very small plate may be successfully cast and meet all requirements, but the hope that casting methods may be successfully applied to very large gold plate work is a myth.

### **Casting Against Metal Parts.**

Sections of dental bridges may be successfully cast and the cast portion be made to pick up the anchorage pieces or backings that have been flaked with the wax. In order that this picking up process may effect a proper union, the flask must be heated almost to the point of fusing the pieces that are to be picked up, and the gold that is introduced as the casting must be superheated quite materially.

Even when these requirements have been complied with, it may possibly not have effected a thorough union. This same feature is present in casting cusps on shell crowns. A safe plan in effecting unions of this kind is to solder them after the casting has been completed. Where foundations or bands are intended to be picked up, they should not contain solder or any alloy of gold lower in quality than that of which the casting is made, unless the bulk of the casting is very much smaller than the bulk of the pick-up. A small pure gold casting will successfully pick up a large platinous gold pin (as for a crown foundation), whereas if a large molar casting of pure gold picks up small platinous gold anchorage pins, these pins will be disintegrated immediately next to the casting and thus rendered worthless. In the later class of work platinum or iridio-platinum should be used. The union between a platinum pick-up and a gold casting is not likely to be a fused one; therefore, in order to get a good mechanical union, these pins should be bent, or headed, or roughened in some way, or should have pure gold flowed on with a blow-pipe before making wax pattern on it.

**Cavity  
Preparation for  
Inlays.**

There are certain fundamental principles that must be observed in cavity preparation for gold inlay work. All margins should be accessible to a burnisher. The operation immediately succeeding the cementing of an inlay in position is to thoroughly burnish its edges. No union should be made in the point of a cusp. In such a union the gold is likely to be burnished back more and more by the force of the opposing teeth, and sooner or later the adjacent enamel wall is likely to be broken away. This condition is exactly similar to that which causes the facing to break from a Richmond crown.

**Preparation of  
Cavity Margins.**

The cavity margins should be beveled more than for a porcelain inlay. A cast gold edge is reliable even at an angle of 60 degrees, and this would mean that the approximating enamel margin would have the reliable angle of 120 degrees. It will be noticed that these conditions are vastly different from the angles used in porcelain work—in which, if either angle is less than 90 degrees, it is not at all reliable; and even when both are 90 degrees, neither one is very durable.

**Anchorage of  
Inlays.**

Where a gold inlay represents any part of the masticating surface of a tooth, its anchorage should be an interlocking one, *i. e.*, the cavity should be so shaped that its form alone would hold an inlay against pressure towards the approximating tooth. This arrangement prevents the cement from being subjected to any actual breaking stress.

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This shape of the cavity is easily obtained by extending it into the nearest fissure in such a manner that the part of the inlay fitting into it will have a dumbbell-shaped end, which, when in position, constitutes the interlocking anchorage. We believe that an anchorage depending entirely on the adhesion of the cement is not strong enough except in protected locations.

### **Making Wax Inlay Pattern.**

To skilfully make wax patterns for this work is a matter in which "practice makes perfect" very rapidly. The pattern is shaped very much like a soft amalgam filling would be shaped, with burnisher, cutting instruments, separating saws, and finishing strips without grit; even a matrix may be used. There are many excellent wax preparations for pattern making for this part of the work. A given wax is not suitable for all cases or all seasons of the year; *e. g.*, a wax rich in stearine is best for inlay patterns; pink base plate wax for crown foundations; and yellow bees' wax for cusps on shell crowns, etc. Wax for any of these purposes should be so highly colored that its color would make an extreme contrast with the color of the enamel, thus facilitating the finishing of the margins. Wax patterns should not be handled with the fingers, but should be placed on a cloth, and by that means handled while inserting the sprue-wire; or, if possible, the sprue-wire should be inserted while the wax is in the mouth. If oil or vaseline have been used in connection with the pattern, the latter must be freed from it with soap and water before investing. This can be easily and safely accomplished by using a small camel's-hair brush and liquid soap.

### **Investments.**

The investment material should be mixed as thick as possible, consistent with the ability to properly manipulate it. This makes a stronger investment than if mixed thin and is thus far less likely to split while heating or casting. The heating should continue until all trace of wax and carbon produced from the wax is burned out. This can easily be determined by the color shown in the sprue and crucible. When these are clear white, without a trace of dark discoloration visible anywhere, the interior mold is ready for casting. As stated before, a smoother casting will obtain if the investment is left quite some time before heating. It is not necessary to superheat the gold to an extreme degree, as was at first supposed, in order to get the best results with this process. A better casting will be produced if the gold is not heated to the bubbling or boiling stage. The more inaccessible parts of a gold inlay should be partly finished before it is cemented in; an approximal side of a molar or bicuspid inlay should be ground and smoothed nicely, except at and near the margins. These must be left untouched until after the inlay is cemented. This

previous grinding greatly facilitates the final finishing, and in no way interferes with or renders questionable the ultimate perfection of the work.

When being tried in, a gold inlay should be seated by a sharp blow with a wooden mallet; cementing in place will be more easily accomplished after this has been done. A cement suitable for this work must be in so fine a state of comminution that no grit can be felt while mixing. Better results will obtain in cementing an inlay if the pressure applied to seat it be a slow and heavy one and accompanied by a rocking movement. Driving with a mallet is not preferred. Have at command a number of cottonwood sticks of varying lengths, and immediately after the inlay is cemented place the rather pointed end of one of these sticks in any depression in the masticating surface of the inlay and direct the patient to bite against the opposite end of the stick and hold tightly. While the patient thus holds the inlay in position, the edges can be burnished without fear of rocking, and thereby disturbing the cement, which very soon becomes friable. This burnishing should be carried to the extent of making the margin of the inlay to so closely approximate the cavity margin as to pinch off all trace of the cement line. This can be done so effectively that in the finished work no cement line is visible even under a magnifier. Grinding and polishing may proceed after a very few minutes, and would be effected the same as for an ordinary gold filling, except that a very hard masticating surface should be given it by an engine burnisher either of agate or corrugated steel.

As has been said elsewhere in this paper, this is no careless or lazy man's method. It does, however, marvelously lessen the abuse that our work heaps upon our intercostals and the exhaustive nervous strain on our patient's sensibilities; and we firmly believe that a good gold inlay is a better tooth-saver than the best gold filling.

### Discussion of Dr. Lane's Paper.

I just want to express my thanks to Dr. Lane for his very valuable paper; I think it is a very practical paper, and I have appreciated listening to it very much. I remember having listened to Dr. Lane seventeen years ago with very great profit. I thank you, Dr. Lane, for the pleasure and information I have derived from your paper.

Mr. President, I enjoyed Dr. Lane's paper very much; I have not taken any notes but there are a great many points in the paper on which men



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differ. One point in the paper I wish to discuss. Dr. Lane said that we must have the mold very hot in order to get union with the gold. Now, Doctors Taggart and Ward claim that you do not. I have here a cast crown which was made on an oxidizable gold stamping, 22-karat, which was not particularly hot, and there is good union. A good way to do it is to heat the gold in the crucible sufficiently to get union.

The subject of investment is one for a long discussion; it was covered very exhaustively by Dr. Ward at the meeting of the Odontological Society last month. I think, on the whole, the paper was a very creditable one; I have certainly enjoyed listening to it.

Mr. President, personally I enjoyed the paper  
**Dr. Straussberg.** read by Dr. Lane very much. One point of importance is the approximal surface of the inlay, which was not mentioned. My recommendation is to add a little wax over the approximal surface, allowing for polishing.

I have enjoyed the paper very much, and I think  
**Dr. Taylor.** we have all listened to it with instruction. I have cast both ways; within three-quarters of an hour, and allowing the investment to set until I was sure it was hard. I have found a very much prettier surface and a more durable surface by allowing the investment to stand a while. I often use the Roach suction carver to advantage. Sometimes it is found necessary, if a tooth becomes tender to the touch, to go down through the filling and open up the pulp chamber. If you have a filling that is thick, solid and strong, you have a great distance to drill through to reach the pulp. The beauty of Roache's method is that you can carve the wax from the inside, making it so thin that you can see the light through the wax. If anything, with such a pattern as that, you are less likely to have contraction of the gold after the gold is cast. You also get a better fit. If you have any trouble with the pulp you will only have to drill through a thirty-second of an inch gold. I have tried casting with a large mass of gold, with five pennyweight of gold and with a small quantity of gold. I think I get the best results with about three pennyweights of gold. If I use a large quantity of gold I do not get as sharp margins.

I have done casting for crown attachments, and I get a better union between my castings and the platinum pin of a Davis crown with ten per cent. of coin silver added to four pennyweights of gold. I cut a dime in half and throw that in, and I think I get a very much better union than with the purer gold cast to platinum.

**Dr. Lane.**

Mr. President, it always seems to me like a rhubarb pie with too much sugar in it if there is no opposition to a paper, and I certainly am very glad that there has been a sprinkling of opposition and exception to the statements I have made.

I have not experimented with vacuum machines, but do not see why there should be any less contraction with that machine than with any other; and I don't believe there is. Gold will contract to a given degree under ordinary conditions. The most pressure a vacuum machine could exert is fifteen pounds. Dr. Taggart claims that gold does not contract under pressure—that is, he used to so claim, but he may not now. Pressure simply *must* prevent it. It may hold it to a certain extent until the point of crystallization has been reached; beyond that it will not; beyond that it contracts as long as the temperature decreases.

I do not think that the selection of an investment is a matter of personal opinion. It is surely not a matter of personal opinion. If we mean to have any regard for the ultimate fit of an inlay, we must have some regard for the mold in which it is made. I could name a commercial investment which, when heated, becomes so loose in the ring that it will drop out. With so much contraction it stands to reason that the mold as well as the investment is reduced in size. An investment should expand as much as the brass flask that contains it. Having recently noticed various writings on the shrinkage problem, and noticing the rather loose way in which the subject was treated, I began a series of experiments, working out tests by micrometer measurements. In every case I get a contraction; this contraction (under varying conditions) I have found to be anywhere from  $\frac{1}{8}$  of 1% to 1.2%. The physical properties of the investment have more to do with the reduction shrinkage than one not having made tests would suppose. I have not completed my experiments, and therefore am not prepared to give more than the range of contraction.

I believe Dr. Waldron stated that Dr. Taggart advocated casting in cold molds for control of contraction. A cold mold would surely give the maximum degree of contraction that would be possible with a given investment. A hot mold—the hotter the better—is best to prevent contraction. In a cold mold the contraction has taken place before the gold is introduced, and the gold then undergoes its contraction. This practically doubles the shrinkage. A hot mold is expanded. Gold cast into a mold thus expanded will, when cold, have contracted to approximately the size of the original pattern.

Regarding the wisdom of having a flask very hot while casting against pick-ups, I would say that this is simply equivalent to a soldering or fusing process, and must be attended by heat; and the mold, pick-up

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and gold must necessarily be heated in order to effect a union. I have seen unions (supposed unions) pull apart. The crown that was passed around a little while ago is not an example of fused union. You may have noticed that the gold cusp extends down at least  $1/16$  of an inch inside of the band, and may easily be a mechanical union and not a fused one. Had this cusp met the edge of the band only, the union would have to be a fused one or none at all; and such a union could be effected only at high heat.

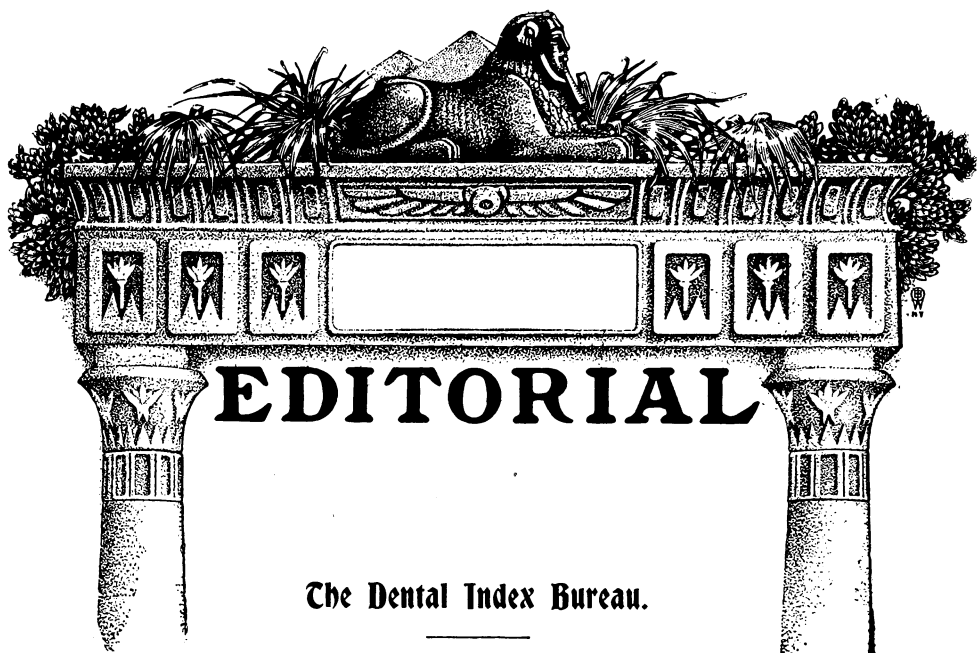
I believe that a statement was made here in regard to changing the margins of inlays by burnishing; that it was not possible. I claim that it is possible, and also very practical. The weak point in any inlay operation is the line of union; and the weakest part of the line of union is the cement line. If we can by any means burnish the edge of the inlay into closer approximation to the cavity margin, we certainly have improved the line of union. We can bring about this change by burnishing.

There is an old axiom that "no chain is stronger than its weakest link." In working out a bevel for inlay margins we try to obtain such angles that the enamel margin will be as strong as the gold margin, and *vice versa*. Now, we can increase the strength of the enamel margin by giving it an angle of 115 degrees, or 120 degrees; and the 60 degree to 65 degrees angle that the gold inlays have is still as strong as that enamel margin. The line of union should never be on the line of the bite.

I have seen that instrument for melting and sucking wax from the back of inlay patterns, and have tried it. It did not appeal to me. I prefer to build in the block of cement while forming the cavity. This reduces the bulk of the pattern without handling it. Any manipulation of the cavity surface of an inlay pattern is likely to disturb it and may necessitate placing it again into the cavity for readaptation. I think there was a misconception of my statements in regard to grinding the cavity side of an inlay. I stated that it was only for the removal of the cast surface, and that it would amount only to the slightest imperceptible relief. It should not be carried to the edge of the inlay at any point.

Another point that was mentioned was that of adding wax for more contour where sufficient separation was not present. This is a good plan, if it can be done without injury to the pattern. Space can then be gained while the inlay is being made.





The Dental Index Bureau has been established under the auspices of the National Institute of Dental Pedagogics. A prospectus will be found elsewhere in this issue. The enterprise should have the support of the profession and especially of dental societies and dental colleges.

Dental education, as has heretofore been pointed out in these pages, is of two kinds; the preparatory or college education and the post-graduate or practical education. Post-graduate education is largely conducted by the dental societies, the teachers being the essayists and the clinicians. The records of these, finding their way into print, constitute our current literature, and thus the journal permits the man in one locality to learn of what is taught throughout the country.

Heretofore the reader of the dental journal has been satisfied to subscribe to one, two, or three magazines, and read them as they arrive in the mails, or perhaps a month or two later. How many men ever read journals one, two, or ten years old? Yet surely all the knowledge printed in the dental journals of 1909 should not die with the dawning of 1910! It is not possible for the journals to reprint annually, all that the dentist should have learned up to date, and if a man is to limit his

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journal reading to issues of the current year, how is he to share in the harvest already garnered?

This great problem seems in a fair way to be solved. Dr. Arthur Black has inaugurated the great movement of maintaining a continuous Index of the literature of dentistry. With such an index the individual, the society, or the college may quickly learn all that has been written on any special subject.

The Illinois State Dental Society, using such an index as the basis and essential foundation of a systematic post-graduate course of study, has established library centers throughout the State, and issues monthly bulletins of questions relating to some practical subject, with indication as to where the answers may be found. Study classes are formed and these classes utilize these bulletins in a course of reading. Thus the habit of study is inculcated.

If anyone ten years ago had prophesied a state of affairs, such as now exists in Illinois, he would have been dubbed a dreamer. Yet the dream has come true. More than that, other State societies, which have imitated the Illinois plan in reorganizing, are already "borrowing" the Illinois bulletins, and organizing similar study or reading classes. All this must necessarily tend toward an elevation of the profession, and if continued will certainly make a body of scientists out of what at present are mainly craftsmen.

The Illinois dream has been realized. Dental Societies in other States are awakening, yet the great dental Gulliver, our so-called National Dental Association, sleeps on. Can we do nothing to arouse him from his lethargy, or shall we let him lie dormant till the band of political pigmies have bound him hard and fast to his doom?





## Reorganization of the National Dental Association.

Dr. R. Ottolengui.

Dear Sir:—In the January ITEMS OF INTEREST, Dr. H. A. Kelly, of Portland, Maine, criticizes in the following language my advocating low dues for the New National Association. “Does that not show one way in which the National Association may need money Dr. Root?” He asks me the question direct.

So my Dear Editor I take the liberty of writing a *Pro Bon Publico* letter, for two reasons, to set myself right, and because I delight in letter writing.

Dr. Kelly quotes me as advocating annual dues at one dollar a year. I have said and still say, if one dollar a year is ample to provide for all needed monies, make the dues that low.

The reasons for having the dues as low as possible, are that the National is to be reorganized, primarily with the object of having a large representative body, the larger the better, to accomplish the desired aims, such as making it an organization demanding respect for its bulk if for no other reason, having a membership sufficiently large to support a National Dental Journal, and etc.

How are you to obtain this large membership? The prevailing idea is by inducing the different State Dental Associations to become Constituent Bodies, so that when you join your State Association, you also become a member of the National. This is the proper way, but what inducements are you going to offer the men who have never joined or attended the National (and who probably never expected to). If your experience leads you to believe that you can excite their patriotism to the extent that they will flock in regardless of any profit to themselves, yours differs from mine. They ask and rightly so, “wherein do we benefit?”

My answer is, you assist in making a large and representative body, one a credit to your profession; you have the privilege of attending or not as you desire; in return for your dues, you have your membership, and the National Dental Journal, all this say for not to exceed one or

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two dollars per year. He will probably agree to this, but place your dues at five dollars, and not 25 per cent. of the desired number will come in. I am not basing my ideas on "What should be, but, What is."

Let's count noses.

There are probably about fifteen thousand members of State Associations. If the reorganization is properly handled, at least two thirds should join the National, giving a membership of ten thousand. This gives an income of \$10,000 per year. The present income is only about \$3,000. Double this for new current expenses, and a surplus of \$4,000 a year results, but as we have no assurance that two-thirds will join, the dues should be placed at \$2, with the understanding that they will be decreased when the membership justifies it.

A great many demand high dues to supply the money for the expected deficit in the expense account of the New Journal. I will concede that for possibly two years such a deficit will exist; after that it will be a case of gross mismanagement, if an established dental journal with ten thousand or more bona fide subscribers is not self-supporting.

### **Expressing a Grouch.**

The National has heretofore been an Eastern Corporation, probably because it usually meets in the East even when in the West. The Eastern man when traveling to the far West, believes he is there when he reaches Chicago or St. Louis. The West does not even begin there. This year the meeting is at the furthest Western point it has ever reached, and Denver is on the Eastern frontier of the West. The real Western man going East thinks he is there when he reaches Denver.

We who live in the center of the universe, in this Garden of Eden—are apparently neither fish nor fowl. We are of the East to the Westerner, and of the West to the Easterner, so we can go either way and generally do. But it is time to tell the West, when the National meets in the West, it means West, not the East, and if the Reorganized National is rightly reorganized, it will have such a numerical strength, that a large attendance will be guaranteed, regardless of the location.

So remember Dear Easterners to study your geographies, locate the West, and come to Denver in July, to vote for the interests of the whole people.

Yours,

J. P. Root.

### Sedative Treatment for Exposed Pulp.

Editor ITEMS OF INTEREST.

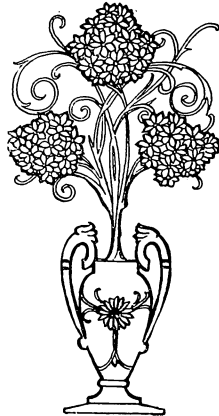
Dear Sir:—For the benefit of suffering humanity, I beg you to kindly publish in the ITEMS OF INTEREST the following remedy:

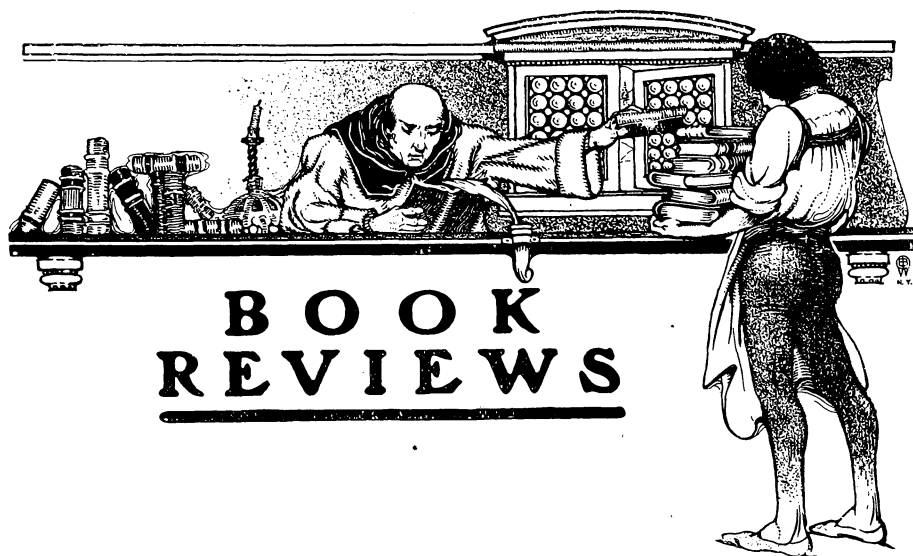
Make a creamy paste of carbonate of soda with carbolic acid. This paste, when applied over an aching, *exposed* pulp, will *instantly* stop the pain. I have tried it in hundreds of cases and never had a single failure.

For painlessly destroying an exposed pulp, apply a very small quantity (smaller than a pin-head) of pure arsenious acid mixed with carbolic acid; over this put the above-named paste and seal with wax or the like.

OSCAR GERDTZEN.

Valparaiso, Chile.





## **Anatomy, Descriptive and Surgical.**

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By HENRY GRAY, F.R.S. New American edition. Revised by J. CHALMERS DAcOSTA, M.D., and EDWARD ANTHONY SPITZKA, M.D. Philadelphia: Lea & Febiger, Publishers, 1908

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Gray's Anatomy reaches with this issue its seventeenth edition in fifty years, conspicuous evidence of its merits, both as a didactic work and book of reference.

The fact that during that fifty years it has suffered few changes at the hands of revisers and editors indicates the completeness of the original work of Henry Gray.

There are but few changes in the literature of such a subject as anatomy.

A more attractive presentation of the subject, involving improvements in text and illustrations, is ever possible, however, and these changes we look for in new editions.

The most radical change in this work is the section on the Nerve System, which, as the publishers say, "has been entirely rewritten, in conformity with recent revolutionary changes in methods of approaching and viewing it," by Professor Edward Anthony Spitzka, of Jefferson Medical College.

## BOOK REVIEWS

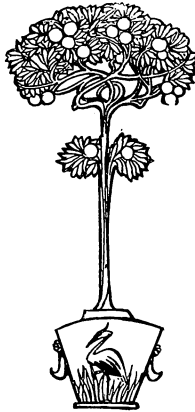
This section is a decided improvement over previous editions, and students, particularly, will be grateful for the simplicity and clearness of the descriptive matter, as well as for several valuable changes and additions among the illustrations.

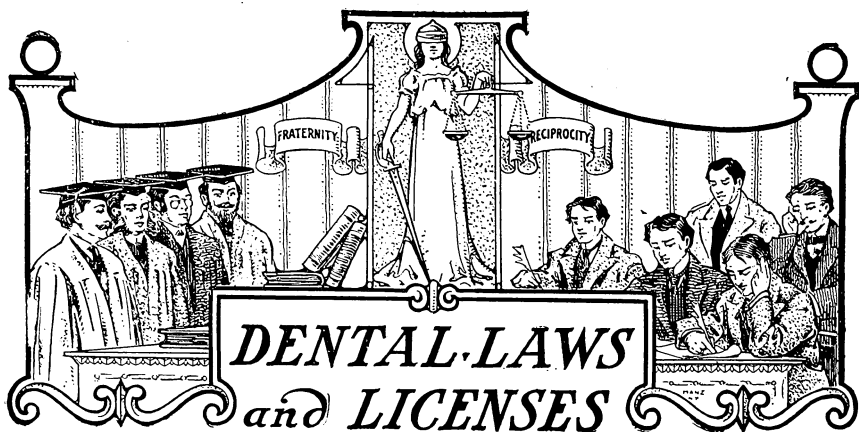
In the chapter descriptive of the First Organ of Digestion, the portion of the work in which the dentist is more particularly interested, there has been no conspicuous improvement over former editions.

Gray's is, no doubt, the standard work on General Anatomy, and, as such, should be considered an essential part of every dentist's library.

The specific anatomy of the oral cavity, however, is treated so much more comprehensively in special works on the subject that Gray's can not be considered as being of particular value in this field.

E. N. K.





## Dental Registration Acts.

By WARREN C. PHILBROOK, Attorney-General of Maine.

*Read before the Maine Dental Society, June 25, 1909.*

When the invitation came from your president to read a paper at this meeting I was somewhat undecided as to what subject to discuss or how to discuss any given one. Just before your program was made out the above theme was suggested to my mind by reason of an inquiry which had come to me from a member of your profession, and to which I was expected to return an opinion. In general that inquiry was "to what extent can persons who have not registered in accordance with the dental law, and have not passed a satisfactory examination before our board of dental examiners, lawfully practice dentistry in this State by being associated or employed by regular practitioners."

As illustrating some of the circumstances which gave rise to this inquiry, I was informed that it is quite a general practice for dentists in this State to employ assistants in their offices to help them in operating, to do laboratory work, and to make themselves generally useful. Instances were called to my attention where dentists in several of our cities have employed unregistered men as assistants and have allowed them also to conduct business on their own responsibility, so far as the relations of the office with the patients were concerned. I was also informed that in many such cases the assistant made the appointments with the patients and did all the work without reference in any way to the registered dentist by whom the unregistered man was employed, except to hand to



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the registered dentist the money received for the services. Certain particular cases were called to my attention such as these:

(A) An unregistered man associated himself with a registered practitioner, ostensibly as an assistant, under the arrangement that the assistant should have the privilege of conducting a dental practice on his own responsibility in return for the work which he did for the registered employer.

(B) A registered dentist allowed an unregistered man to open an office in the name of the registered dentist and conduct a practice on percentage basis.

(C) A registered dentist, convalescing from a severe illness, employed an unregistered dentist to take his business, making announcement that the unregistered man had full charge of the office.

To the end that advice may be given, we naturally turn first to chapter 43 of the P. L. of 1891, which is the so-called dental registration act of this State. I not only examined this registration act, but I have examined registration acts of several other States and also some cases which have found their way into the courts arising under the dental acts in other States. I do not find any case in this State where the court has attempted to construe the provisions of our dental registration act.

Section 1 of our act provides: No person shall practice, attempt to practice, or hold himself out to be a practitioner of dentistry or dental surgery until he or she shall have first received a certificate as hereinafter provided; and whoever violates the provisions of this section, shall be fined not less than twenty-five, nor more than one hundred dollars for each offense." The act also provides in subsequent sections for the creation of a board of examiners and for the organization of that board, for the registry of persons practicing dentistry, for the examination of a person desiring to practice dentistry or dental surgery in this State, and for certain fees to be paid by those desiring examination. The final paragraph of the act provides: "Nothing in this act shall be so construed as to restrict or interfere with physicians and surgeons in the discharge of their professional duties, or with any citizen in the extraction of teeth in cases of emergency."

When I examined our act in comparison with those of other States I was immediately impressed with the idea that our act was not as clear and definite as might be desired and that the circumstances which would constitute a violation of our act were not as well defined as one might wish them to be. In fact, very general, and I might even say loose, expressions occur in our act where in many other States the language is much more explicit. I do not wish to be understood as criticizing our act in any unfriendly spirit but later I shall call your attention to a few

## ITEMS OF INTEREST

of the provisions found in the acts of other States, and suggest to you who may be interested in the matter whether or not at some later session of the legislature it would not be wise for you to revise the dental registration act of Maine. Before discussing any of the dental registration acts of other States I wish to briefly discuss our act along the lines on which I gave my opinion to the member of your profession who asked my advice as I previously stated.

### **What Constitutes Practicing Dentistry.**

Our act says, "no person shall practice, attempt to practice, or hold himself out to be a practitioner of dentistry or dental surgery until he or she shall have complied with certain provisions of law." We are then first called upon to define the meaning of the expression "practicing dentistry or dental surgery." What is meant by these words? What constitutes the practice of dentistry or dental surgery, and what may a man safely do and not be guilty of practicing dentistry or dental surgery in violation of law in Maine? The whole prohibition of our dental act is found in the answer to these inquiries. Of course it is understood that I am not now discussing any of the exceptions made in favor of physicians and surgeons or citizens extracting teeth in cases of emergency.

During my investigation I examined the dental registration act of the State of Arkansas and found it to be so similar to our own that I was led to the conclusion that the Arkansas statute must have been in the mind of the person who prepared the Maine act. Under the decisions of the Arkansas court I found an interesting case where a man was arrested for violation of the dental registration act of that State and the evidence showed that the respondent, at the time of committing the alleged offense, was a student under a regular registered dentist in the city of Arkadelphia. The evidence also showed two instances in which this respondent student performed dental work both of which acts were done apparently under the advice of the registered dentist in whose office the student was working. In one instance he extracted teeth and in the other filled teeth, and the evidence showed that for the work of extracting nothing was charged by the student and nothing received by him, but in the case of filling teeth he charged and received the sum of ten dollars from the patient, appropriating the sum to his own use, and not turning it over to the dentist in whose office he was at work. The question arose as to whether this student was practicing dentistry or dental surgery, and the court said in discussing the case that it was impossible to escape the conclusion that the *performance of dental work and charging and receiving pay therefor* is practicing dentistry, and that although the relation of student and preceptor existed between the respondent and dentist in

## ITEMS OF INTEREST

whose office he was, yet, so far as the dental work was concerned, the charge was not made in the name of the registered dentist nor was the pay received by him, but, on the other hand, the student made the charge for himself and received the pay. Such conduct was declared by the court to be practicing dentistry and to be a violation of the dental act of the State.

Another Arkansas case furnished the following rule of court: "A dental student who performed dental work without a certificate from the board of dental examiners, and received pay therefor, is practicing dentistry." If our court, under a statute almost exactly like that of Arkansas, should adopt the views of the Arkansas court, which I am inclined to believe it would, then these would be illustrations of a violation of our dental registration act.

You will observe two distinct elements in these rulings of the court first, the performance of dental work; second, charging and receiving pay therefor. As the second element is easily understood we look a little further to see what the courts and other authorities have said about the first, or, in other words, what is a dentist and what is dental work.

In a Rhode Island case we find the following:

### **Dentist Defined.**

"A dentist is a dental surgeon. He performs operations upon the teeth and jaws, and, as incidental thereto, upon the flesh connected therewith." In a Michigan case the court said, "Dentistry was formerly purely mechanical, and instruction in it scarcely went beyond manual dexterity in the use of tools. A knowledge of the human system generally, and of diseases which might affect the teeth and render an operation important, was by no means considered necessary. Of late, however, as the physiology of the human system has become better understood and the relation of its various parts and their mutual dependence are more clearly recognized, dentistry has made great progress as a science." In a Mississippi case the court said, "It is true that the practice of the dentist's art requires the use of instruments for manual operation, and that much of it consists in manual operation; yet it also involves a knowledge of the physiology of the teeth, which can only be acquired by a proper course of study, and this is taught by learned treatises on the subject and in institutions established for the purposes, and is a distinct, though limited, department of the medical art." Coming close to the exact definition of "dentist" I quote the following from a North Carolina case: "A dentist is one who performs manual or mechanical operations to preserve teeth, to cleanse, extract, insert or repair them." Another definition, found in a Michigan case, is in the following words: "A dentist is one whose profession is to clean and

## ITEMS OF INTEREST

extract teeth, repair them when diseased, and replace them, when necessary, by artificial ones."

Some legislative definitions may also be cited to good purpose. The Pennsylvania statute defines practicing dentistry as follows: "Every person shall be understood as practicing dentistry, who shall for fee, salary, or other reward, either to himself or another person, operate upon human teeth, furnish artificial substitutes, or perform those acts, as assistant or principal, usually understood as and called dental operations."

The Washington code declares that "all persons shall be said to be practicing dentistry who shall for a fee or salary or other reward paid either to himself or to another person, for operations or parts of operations of any kind, treat diseases or lesions of the human teeth or jaws, or correct malpositions thereof."

You will observe from these rules and definitions that the tendency of the court and legislatures is to regard laboratory work *only* as not rising to the dignity of practicing dentistry or doing dental work. While the dentist may be, and often is, obliged to do laboratory work, yet his professional standing in courts of law and legislative halls seems to rest upon the fact of his treating the human patient through his skill and knowledge of the human system.

With these suggestions as guides let us examine the cases upon which my dental friend, to whom I referred at the beginning of this paper, desired advice.

**Special Cases.** Case A: An unregistered man associated himself with a registered practitioner, ostensibly as an assistant, under the arrangement that the assistant should have the privilege of conducting a dental practice on his own responsibility in return for the work which he did for the registered employer.

My answer to this is that if the unregistered man operated in any way upon the patient and received directly or indirectly any fee, reward or emolument of any kind, his conduct was in violation of our registration act.

Case B: A registered dentist allowed an unregistered man to open an office in the name of the registered dentist and conduct a practice on percentage basis.

My answer to this is that this also was a clear violation of our dental registration act, if the unregistered man operated upon the patient in any way.

Case C: A registered dentist, convalescing from a severe illness, employed an unregistered dentist to take his business, making announcement that the unregistered man had full charge of the office.

## ITEMS OF INTEREST

My answer to this is in the same line with that returned to cases A and B.

Considering the dental registration act of this

**Laboratory Work.** State in a general way, in the light of what I have already called to your attention, I feel quite safe in advising you that an unregistered man should not be allowed in this State to operate in any way upon a patient by way of practicing dentistry, if he were to receive directly or indirectly as a result of his work any reward, fee, or emolument whatever. You will observe that none of the cases to which I have called your attention seem to forbid an assistant from doing laboratory work or making himself generally useful about an office providing that he is not operating on a patient and I confess that I fail to see anything in the Maine registration act which would render a person liable for conduct of this kind. As I have already said, I think the Maine act is somewhat vague and indefinite and perhaps now you will begin to understand why I have said so.

Let us turn to one or two illustrations in the registration acts of other States and see if we do not discover in them some particular provisions which we would wish to incorporate in our law to the end that such incorporation may be made at a subsequent session of the legislature if parties are sufficiently interested to attend to it.

As clearly showing the right to work in the laboratory, section 8 of the New Jersey act provides as follows:

"This act shall not be construed to prohibit an unlicensed person from performing mechanical work upon inert matter in a dental office or laboratory; or to prohibit the registered student of a licensed dentist from assisting his preceptor in dental operations while in his presence and under his direct and immediate personal supervision; or to prohibit a duly licensed physician from treating the diseases of the mouth or performing operations in oral surgery; nothing in the provisions of this act shall be construed to permit the performance of dental operations by any unlicensed person under cover of the name of a registered practitioner."

Here you will observe a clear, distinct provision that an unlicensed person may perform mechanical work upon inert matter in the office and laboratory of a dentist; also distinct provisions relating to the rights of a student to assist his preceptor under certain well-defined and carefully prepared conditions. It also strictly forbids the performance of dental

## ITEMS OF INTEREST

operations by any unlicensed person under cover of a name of a registered practitioner. This, last condition is one which, I understand, has frequently arisen in this State and can only be reached under our registration act by somewhat obscure and unsatisfactory provisions of law. The New York code also, in explicit terms, allows an unlicensed person to perform mechanical work upon inert matter in the office or laboratory of a dentist, and also in clear terms permits the student to assist his preceptor, providing that the assistance is rendered while in the presence and under the supervision of his instructor. New York also distinctly provides that no licensed person shall perform independent dental operations under the cover of the name of a registered practitioner. Our neighboring State of Massachusetts, while using somewhat general language, is a little more exact by forbidding an unlicensed person from performing any operation on, or making an examination with the intent of performing, or causing to be performed, any operation on the human teeth or jaws. In other words, the definition of dentistry according to the rules which I have given you in certain cases decided by the courts is rather more nearly reached in the Massachusetts statutes than in our own. Minnesota defines in terms what she means by practicing dentistry and says, "all persons shall be said to be practicing dentistry within the meaning of this act who shall have a fee or salary, or other reward, paid either to himself or to another person for operations or parts of operations of any kind, treat diseases or lesions of the human teeth or jaws, or correct malpositions thereof; but nothing in the act is to be taken as applying to acts of bona fide students of dentistry done in the pursuit of clinical advantages under the direct supervision of a preceptor or licensed dentist."

Here again you discover the distinct element of fee or salary, or other reward for the work performed, as being an essential element in the definition of practicing dentistry which we have been discussing. You will also note the ample protection to bona fide students and their acts when done in the pursuit of knowledge and under the direct supervision of their preceptors.

I might call your attention to existing laws enacted by the legislatures of other States, but I think I have gone far enough to show you that perhaps our Maine act is not as satisfactory and complete as it might be made, and if I have succeeded in this, and the members of your profession deem it wise to ask for additional legislation, you will, of course, under competent assistance and at a proper time, ask the legislature for such amendments and additions to our existing law as may seem for the best interests of your profession.

I might also further enlarge somewhat upon the general views of the courts in various States, touching upon such questions as define the

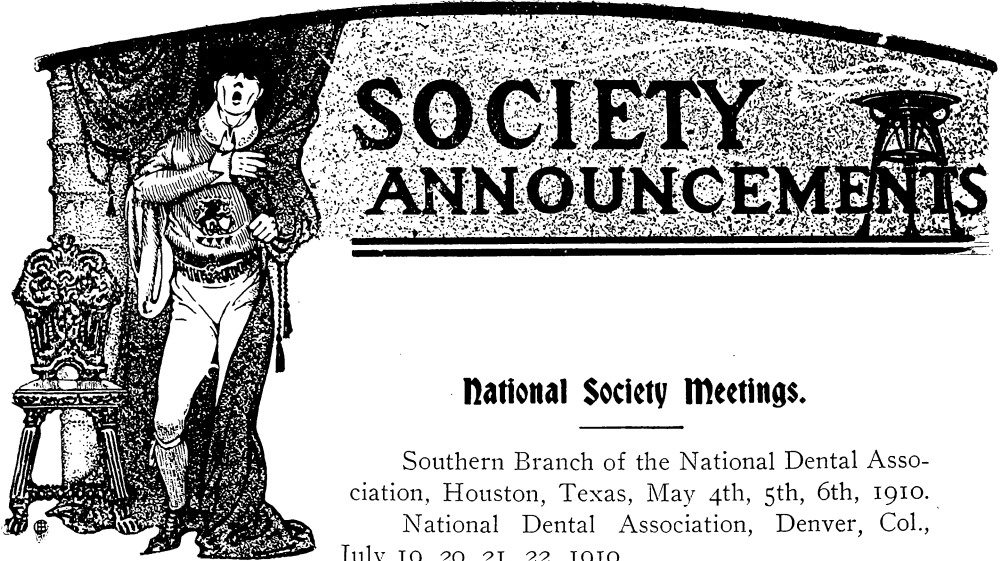
## ITEMS OF INTEREST

legal status of the dentist, but I think I have gone as far in that direction as may be necessary in talking to a company of professional gentlemen. Perhaps I can do no better than to again express the generalization which seems to obtain in all the cases which I have examined, namely, that the art of dentistry consists in operations upon the human patient and receiving either directly or indirectly some fee, reward or emolument for so doing. Work of a lower order than this, including laboratory work, while often done by dentists, may, as it seems to me, be safely done by those who are unregistered, and the one so doing not be guilty of violation of any statute law of this State.

Interesting points might also be brought to your attention along lines in which your rights and liabilities are similar to those of the doctor of medicine, but that discussion would open a field too wide to be covered at this time and in connection with this paper.

In conclusion, I simply wish to express my own high estimate of the character and ability of the men in this State who make up the ranks of practicing dentists. Your profession is one surrounded by difficulties and some dangers. Patience, skill, good judgment and intelligence are demanded in a high degree from those who enter your ranks. With you, as with all others who form any class, guild, or profession, you will best serve the present day and future generations by insisting upon compliance with the highest professional and ethical standards. Do not be time-servers, do not yield to the temptation of expediency, abhor selfishness, look for the best good to the greatest number, and the future of yourselves as individuals, your successors in your profession and the profession itself will be assured.





### **National Society Meetings.**

Southern Branch of the National Dental Association, Houston, Texas, May 4th, 5th, 6th, 1910.

National Dental Association, Denver, Col., July 19, 20, 21, 22, 1910.

National Association Dental Examiners, Denver, Colo., Aug. 1, 1910.

American Society of Orthodontists, Denver, Col., July 13, 14, 15, 1910.

### **State Society Meetings.**

Alabama Dental Association, Mobile, Ala., May 10, 1910.

Connecticut State Dental Association, New Haven, Conn., April 19, 20, 1910.

Illinois State Dental Society, Springfield, Ill., May 10, 11, 12, 13, 1910.

Indiana State Dental Association, Indianapolis, Ind., May 17, 18, 19, 1910.

Iowa State Dental Society, Des Moines, Ia., May 3, 4, 5, 1910.

Maine Dental Society, Rangeley, Me., June 22, 23, 24, 1910.

Massachusetts Dental Society, Springfield, Mass., June 8, 9, 10, 1910.

Mississippi Dental Association, Jackson, Miss., May 24, 25, 26, 1910.

Missouri State Dental Association, St. Louis, Mo., May 24-27, 1910.

Montana State Dental Society, Great Falls, Mont., May 6, 7, 1910.

Nebraska State Dental Society, Omaha, Neb., May 17, 18, 19, 1910.

New York State Dental Society, Albany, N. Y., May 5, 6, 7, 1910.

Pennsylvania State Dental Society, Harrisburg, June 28, 29, 30, 1910.

Kansas State Dental Association, Topeka, Kansas, May 17, 18, 19, 1910.





## SOCIETY ANNOUNCEMENTS

Louisiana State Dental Society, New Orleans, La., May 16, 17, 18, 1910.

Texas State Dental Association, Houston, Texas, May 3, 1910.

Vermont and New Hampshire Dental Societies, Rutland, Vt., May 17, 18, 19, 20, 1910.

Virginia State Dental Association, Staunton, Va., July 20, 21, 22, 1910.

Wisconsin State Dental Society, Ashland, Wis., July 12, 13, 14, 1910.

West Virginia State Dental Society, Parkersburg, W. Va., Oct. 12, 13, 14, 1910.

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### **American Dental Society of Europe.**

The thirty-seventh annual meeting of the American Dental Society of Europe will be held in Paris, France, on March 25th, 26th and 28th, 1910, at Hotel Continental.

A most cordial invitation is extended to members of the profession to be present.

T. G. PATTERSON, Hon. Secretary.

2 Quai des Eaux-Vives, Geneva, Switzerland.

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### **Southern Branch of National Dental Association.**

The thirteenth annual meeting of the Southern Branch of the National Dental Association will be held in Houston, Texas, Wednesday, May 4th, 1910, continuing in session three days.

The association has accepted the invitation of the Texas State Dental Association to meet conjointly with them and as their guests.

The officers and members are actively at work, and a most instructive program is being arranged.

A preliminary program will be announced later.

CARROLL H. FRINK, D.D.S., Recording Secretary.

Suite 301-302 Masonic Temple, Jacksonville, Florida.

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### **Louisiana State Dental Society.**

The thirty-second annual meeting of the Louisiana State Dental Society will be held at the Grunewald Hotel, in New Orleans, May 16, 17, 18, 1910.

W. C. RICHARDSON, Secretary Executive Committee.



## **The Dental Index Bureau.**

A plan by which subscribers will be furnished a classified card index of articles in the leading Dental Journals. Of especial interest to students, writers, publishers, editors, librarians, colleges, dental societies, etc.

At a meeting of the National Institute of Dental Pedagogics, held in St. Louis last December, a committee was appointed to establish a Dental Index Bureau. Briefly stated, it is intended that this committee shall employ a competent person to review and classify all of the articles in ten or twelve of our leading dental journals, and shall furnish to each of the subscribers to the Bureau, at frequent intervals, cards so classified and grouped that the subscriber may easily and quickly find all the articles on any subject in dentistry. These cards will be made on a definite system, by which additional cards may be added as they are received and always go to their proper places; so that no matter how many additions may be made from year to year, all of the cards on each subject will be in a separate group. For example, all of the articles on the subject of filling teeth with gold will be in one group, all on filling teeth with amalgam in another, all on cavity preparation in another, all on alveolar abscess in another, etc.

It is hardly necessary to mention the value of such an index to the wide-awake members of the profession. Journals which may have accumulated, and which are now almost worthless on account of the difficulty in finding articles when desired, will become of service as the index is extended to cover them. The man who has occasion to look up a particular subject, or to write a paper, can find all that has been written on that subject instantly. The grouping of articles on each subject enables one to bring together the views of many writers. Post-graduate courses of study can be instituted by dental societies or undertaken by individuals; the ready-reference index will make college libraries of the greatest value to the faculty and to the student body; editors and writers will find their work facilitated, and the results of their study more gratifying to themselves and more highly appreciated by their readers.

The idea of the committee is to organize a permanent society for the purpose of classifying and indexing all dental literature. The present plan is but preliminary to the greater work, which will cost less to individual subscribers as the number of members is increased. Those who help to start the work will profit more than those who follow, and will have the satisfaction of participating in one of the greatest advance movements in dentistry.

The subject-matter of several of the leading dental journals has already been classified and indexed by Dr. Arthur D. Black, at a great



expenditure of time and money. This index contains about 40,000 cards, cataloging articles in various journals from 1839 to date; but it is not available, for obvious reasons, to the profession at large. Your committee is privileged to copy these cards, should the funds subscribed permit, which would be of great benefit to the subscribers and incidently to the whole profession.

It is the committee's intention to this year furnish each subscriber with author and subject cards for all original articles, papers read before societies, book reviews, and editorials, in about ten journals for 1908 and 1909—from 4,000 to 5,000 cards, all properly arranged with all cards for each subject together, with guide cards for each subject, and with author cards arranged alphabetically. It is expected that in 1910 the cards will be furnished for the same journals for the years 1907 and 1910; and in 1911 cards for 1906 and 1911. Thus in three years each subscriber will receive cards for these journals for six years—probably 25,000 to 30,000 cards. These cards will be sent in boxes in which they may be kept permanently. The number of journals indexed and the number of cards sent out by the committee, however, will depend upon the number of subscribers.

The preliminary report of this committee, which was made at the St. Louis meeting, gives an outline of the plan. It will be noticed that it is the intention to try this plan out for a period of three years, and subscriptions at the rate of Twenty-five Dollars (\$25.00) a year for that period may be sent to any member of the committee.

Subscriptions will be received from individuals, dental journals, dental schools, or dental societies. Any person or group of persons may send in a single subscription, and one set of cards will be sent in return. Subscription blanks may be had from any member of the committee.

### **Report of the Committee on Classifying and Indexing Dental Literature, to the Institute of Dental Pedagogics at the Annual Meeting, St. Louis, 1908-09.**

The undersigned committee, appointed by the Institute of Dental Pedagogics for the purpose of devising ways and means of classifying and indexing current dental literature, as an evidence of progress, presents to the members of the Institute and others interested the following plan:

1. That the subscribers to this plan organize themselves into an association to be known as The Dental Index Bureau.
2. That the above-mentioned committee, appointed by the Institute, will devise ways and means for carrying out the work of the Bureau

## ITEMS OF INTEREST

during the coming year, and will call a meeting at the time and place of the next meeting of the Institute, for the perfection of a permanent organization.

3. That this committee will employ a competent person to classify as much of the current dental literature as possible, beginning with January, 1909, journals, and will furnish subscribers, at frequent intervals, with author and subject cards of all articles classified.

4. That this committee will be guided by a vote of the subscribers in the selection of the literature to be classified.

5. If the funds subscribed will permit, as much as possible of the literature of previous years will be similarly classified and indexed.

W. L. FICKES, Chairman,  
6200 Penn Ave., Pittsburg, Pa.

ARTHUR D. BLACK,  
31 Washington St., Chicago, Ill.

HERMAN PRINZ,  
603 Century Bld'g, St. Louis, Mo.

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### American Circulating Dental Clinic.

The Cleveland Dental Society has appointed a committee to be known as the American Circulating Dental Clinic, consisting of Doctors G. H. Wilson, W. A. Price, H. L. Ambler, Guy D. Lovett, V. E. Barnes and S. M. Weaver.

The object of said committee was to arrange an interchange of clinics with a given number of cities, probably seven, representing seven sections of the United States

The cities chosen are Cleveland, New York, Philadelphia, Chicago, Kansas City, Los Angeles and New Orleans.

The idea is to have each society appoint a similar committee of six to co-operate with the other cities. Each committee's duty would be to collect (say ten) of the best possible clinics from their districts. Clinics to be composed of New Devices, New Methods, Superior Pieces of Workmanship, or anything the committee should elect as an educational clinic of sufficient importance.

We want the *new things* brought out and believe this will be the best way to bring the different sections of the United States in close touch with one another.

We realize there are many valuable ideas and appliances lying around dormant and kept from the profession because the originator is not a writer for magazines, or he is too busy to take the time to exploit them.

An active committee will be able to obtain a great many such and

## SOCIETY ANNOUNCEMENTS

induce the men to put them in a presentable shape for the American Circulating Dental Clinic.

We are desirous of having the committees appointed at once, so they will have time to provide their display. The idea at present is to have the clinics all shipped to Cleveland first and arranged in a systematic and presentable shape for exhibition. Also, arrange the combined clinics in shipping trunks so that they may be forwarded to the next city. Each clinic is to have a short typewritten explanation to accompany it, so any member of the committee to whom it is shipped could examine it and be able to explain in a few words at time of exhibition.

After the clinics have made the round of the circuit, Cleveland, for instance, would take out her old clinic and put in a new one, and so on around the circuit. This would give each city practically one year to collect the new exhibit.

There being seven cities in the circuit would take in the winter months, say from October to April, the probable months in which societies hold their meetings. These dates will have to be arranged later to best accommodate all.

We do not want this Exchange for Convention use, but as a grand show for the city and surrounding territory which it represents. The committees have been chosen from men who are enthusiastic and who frequent conventions in order to meet with progressive men. The committees are appointed in the following manner: two for three, two and one years respectively. In this way the oldest members, being familiar with the work, would be of great assistance in keeping up the high standard of clinics which we hope to obtain.

There are more details to be worked out later and the Cleveland Committee will welcome any suggestions from the other committees.

The aforesaid cities have been chosen as best representing their section of the United States and we hope to receive immediate and encouraging co-operation. If we all work together we can make these meetings the largest exhibitions of progressive dentistry ever seen.

All clinics should be sent to your District Chairman, and he in turn will send his combined clinic to Cleveland for the first meeting so they may be arranged for the trip around the circuit.

We hope every city chosen will put its shoulder to the wheel and try to make its exhibit the best.

Yours truly,

S. MARSHALL WEAVER,  
*Central Chairman.*

N. B. Send clinics to your *District chairman* keeping models small and light as practical. Accompany each with a detailed description as concise as possible.

## ITEMS OF INTEREST

At a meeting of the Chicago Committee on the American Circulating Dental Clinic it was decided, in order to create interest and reach the greatest number of dentists who otherwise might not be asked to clinic, to make the clinic competitive. This will give every man who has a new idea a chance to compete. A letter explaining the clinic in detail should be sent to the District Chairman, Dr. D. C. Bacon, 103 State Street, Chicago, and the clinic under separate cover with concise explanation accompanying it. Each clinic will be given a number as it arrives and the Committee will select the ten best, after which the names will be attached so that the Clinician may receive full credit for his work.

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### Reading Dental Society.

At the 12th annual meeting of the Reading Dental Society the following officers were elected to serve for the ensuing year: President, T. T. Bair; Vice-president, G. F. De Long; Secretary, G. S. Schlegel; Treasurer, M. U. Gerhard.

The Free Dental Dispensary Board is as follows: C. V. Kratzer, President; W. H. Scholl, H. W. Bohn, C. R. Schroll, M. U. Gerhard, G. S. Schlegel, Secretary.

GEO. S. SCHLEGEL,  
*Secretary.*

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### The G. U. Black Dental Club Clinic.

Everybody interested in advanced dentistry is cordially invited to attend the annual clinic of the G. V. Black Dental Club.

The meetings will be held in the old State Capitol Building in St. Paul, on Thursday and Friday, February 24th and 25th, 1910.

The program was in part published in the January Dental journals, and it does not seem necessary to publish it again.

There will be operations of all kinds. A large number of men will hold table clinics.

A large number of manufacturers have reserved space and will be present to demonstrate the new things in dentistry. The profession generally is invited to attend.

For any information address,

R. B. WILSON, Secretary.

American National Bank Building, St. Paul, Minn.



## **Arizona Board of Dental Examiners.**

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There will be a meeting of the Arizona Board of Dental Examiners on the 18th, 19th, 20th and 21st day of April, at Tucson, Arizona.

Candidates should have their application, and fee of \$25.00 should accompany same, at least twenty days before meeting.

Theoretical examination includes the following subjects: Anatomy, Physiology, Chemistry, Materia Medica, Therapeutics, Metallurgy, Histology, Pathology, Operative and Mechanical Dentistry, Oral Surgery. Practical Demonstration of Skill in Operative and Mechanical Dentistry will also be required, and candidates should come prepared with instruments and material for making fillings and crowns in the mouth.

W. A. BAKER, D.D.S., Secretary and Treasurer.

Tucson, Arizona.

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## **The National Association of Dental Examiners Meeting.**

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The twenty-eighth annual session of the National Association of Dental Examiners will be held at the New Savoy Hotel, Denver, Colorado, commencing Monday, August 1, 1910, at 10 A. M. The rates will be \$2.00 per day for one person, or \$3.00 per day for two, European plan, large rooms for one or two persons with private bath \$4.00 and \$5.00 per day. Meeting and Committee rooms at the service of the Association free and every accommodation extended.

An early mail reservation is requested, the time being the busy season.

A full representation from every State Board of the United States is earnestly desired.

J. J. WRIGHT, D.D.S., President.

Wells Bldg., Milwaukee, Wis.

CHARLES A. MEEKER, D.D.S., Secretary and Treasurer.

29 Fulton Street, Newark, N. J.

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## **Oklahoma State Dental Association.**

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The Oklahoma State Dental Association will hold its annual meeting in Tulsa, Okla., June 3rd and 4th. Will have one of the most interesting meetings that has ever been held in the Southwest.

A. L. WALTERS, Secretary.

Checotah, Okla.



## **West Virginia State Dental Society.**

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The next meeting of the West Virginia State Dental Society will be held at Parkersburg, W. Va., beginning the second Wednesday in October, 1910, and continuing three days.

F. L. WRIGHT, Secretary.

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## **Texas State Dental Association and Southern Branch of the National Joint Meeting.**

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The annual meeting of the Texas State Dental Association will be held at Houston, Texas, May 3, 1910. On May 4, 5, and 6 the Association will hold a joint meeting with the Southern Branch of the National Dental Association at the same place. The profession is cordially invited to visit Texas on this occasion.

J. G. FIFE, Secretary.

Dallas, Texas.

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## **St. Louis Society of Dental Science.**

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The St. Louis Society of Dental Science, at the December meeting, elected the following officers: C. O. Simpson, president; G. E. Hourn, vice-president; J. P. Marshall, secretary; C. S. Dunham, treasurer; H. W. Lansberg, curator.

Executive Committee: E. P. Dameron, Richard Summa, A. H. Winklemeyer, W. E. Wilson, and W. B. Arthur.

Advisory Council: G. A. Bowman, B. L. Thorpe, A. H. Fuller, D. O. M. LeCron, Adam Flickinger, W. E. Brown, and E. E. Haverstick.

J. P. MARSHALL, Secretary.

7401 Hazel Ave., St. Louis, Mo.



